DK Pocket Genius

ANIMALS

FACTS AT YOUR FINGERTIPS

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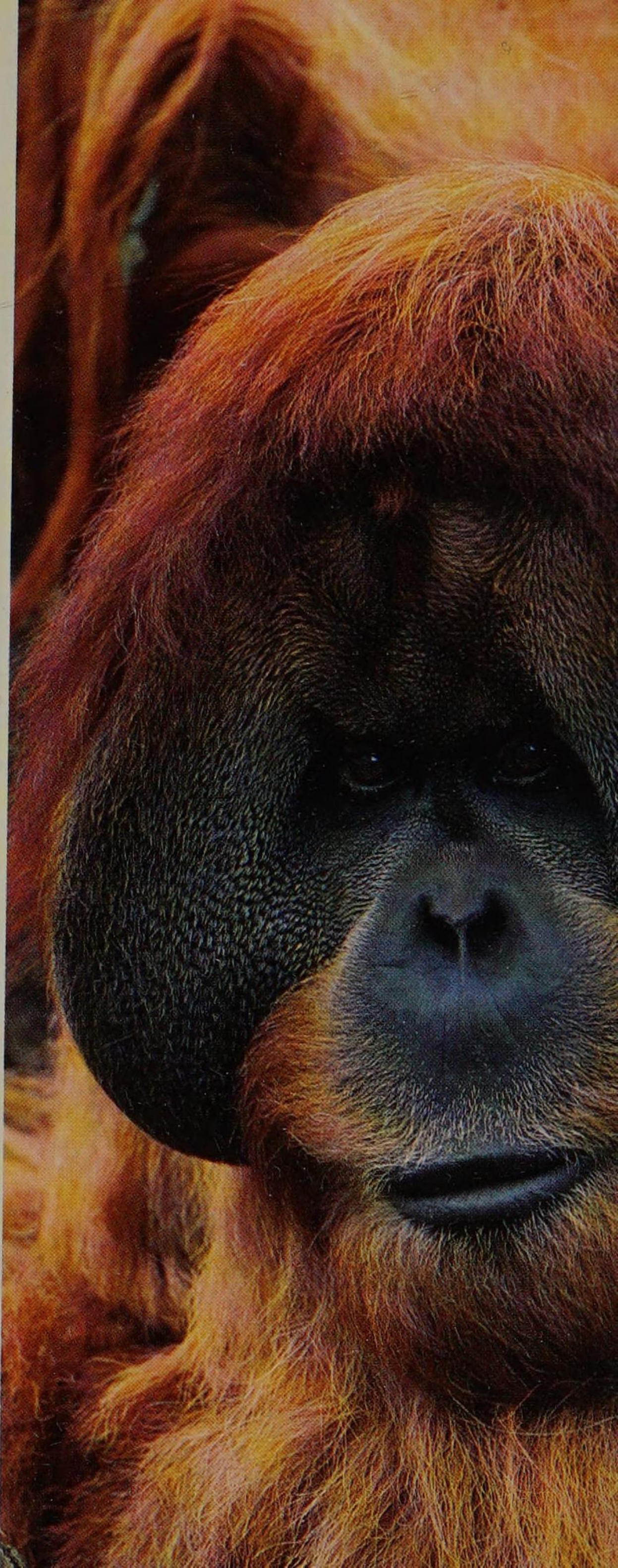

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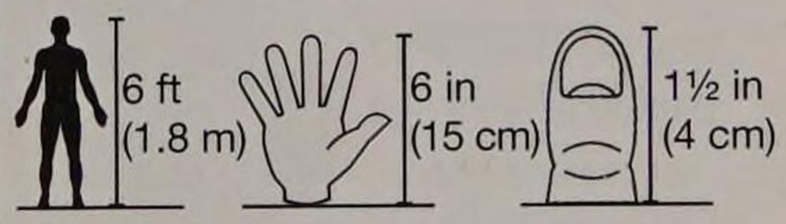
Scales and sizes
The book contains profiles of animals with scale drawings to show their size.



Endangered animals
This label indicates that the animal is in danger of dying out.

ENDANGERED

Animal kingdom

The animal kingdom is a vast collection of almost 2 million creatures, both weird and wonderful. Members of this group come in many different shapes and sizes, but all have bodies of cells and eat food to get their energy.

Vertebrates

These are animals with backbones. The first ones evolved from an invertebrate ancestor more than 500 million years ago.

Mammals include platypuses, kangaroos, bears, whales, apes, and elephants.

Reptiles include turtles, tortoises, lizards, snakes, and crocodilians.

Fish include lampreys, sharks, rays, carp, salmon, and perch.

Birds include ostriches, penguins, ducks, waders, birds of prey, and songbirds.

Amphibians include frogs, toads, salamanders, and newts.

Invertebrates

These animals lack a backbone and include a variety of creatures, ranging from sponges and worms, to molluscs, such as this octopus.

The common octopus is an invertebrate

Arthropods include insects, centipedes, crabs, spiders, and scorpions.

Molluscs include slugs, snails, octopuses, squid, oysters, and clams.

Echinoderms include starfish and their relatives.

Worms are of many different kinds including flatworms, roundworms, and segmented worms.

Cnidarians are simple animals, including sea anemones, corals, jellyfish, and hydroids.

Kingdom: Animals
This is the broadest group that includes all members of a particular kind of organism, such as an animal or a plant. The animal kingdom contains all the animals in the world.

Phylum: Chordates
There are 35 smaller groups in the animal kingdom, each called a phylum. The phylum Chordates includes the vertebrates – animals with backbones.

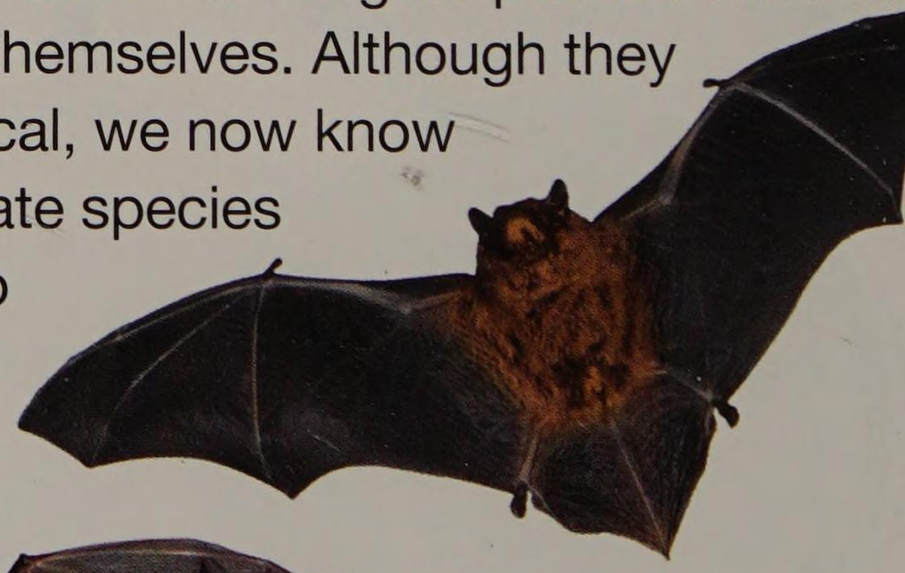
Class: Mammals
A class is a major division of a phylum. The mammals form a class of warm-blooded vertebrates. Most mammals give birth to live young.

Animal species

The animal kingdom contains an amazing variety of creatures. In order to study them better, they are organized into groups. Closely related animals are grouped together. Each animal is identified by a unique two-part label. The first part denotes the animal's genus and the second indicates the species.

What is a species?

A group of animals that can breed with each other forms a species. There are always some differences between animals of the same species. On the other hand, animals of different species may be very similar. For example, in 1999, scientists noticed that some common pipistrelle bats had a higher-pitched call and only bred among themselves. Although they look almost identical, we now know they form a separate species called the soprano pipistrelle.



Common pipistrelle

Soprano pipistrelle

Order: Carnivores
A class is further divided into orders. The order of carnivores contains meat-eating mammals. These animals have special teeth.

Family: Cats
Every order has families. The cat family includes big cats, such as lions and tigers, as well as small cats, such as bobcats and pumas.

Felis

Genus: Small cats
Families contain genera (plural of genus). The domestic cat belongs to the genus *Felis*, which contains some types of small cat.

Species: Domestic cat
The domestic cat belongs to the species *silvestris*. It is a descendant of the wildcat and has spread all over the world, living in most human settlements. Scientists call it *Felis silvestris*.

Felis silvestris

Evolution

Living organisms may change over many generations in a process called evolution. It is driven mainly by natural selection – animals better suited to survival leave more offspring, and pass on to those offspring the characteristics that help them survive.

Natural selection

Some animals inherit certain features from their parents that increase their chances of survival. Those that survive have offspring of their own and pass on their useful features. These offspring are also able to survive better. This happens over many generations and may result in a major change in the species.

Colour that camouflages a moth better will be passed on to the next generation

Elephant evolution

Every life form on Earth today has evolved over millions of years from ancestors that looked very different. Elephants evolved from an unknown ancestor similar to *Moeritherium*, which lived 37 million years ago and looked more like a hippopotamus.

Gomphotherium

Phioma

Moeritherium

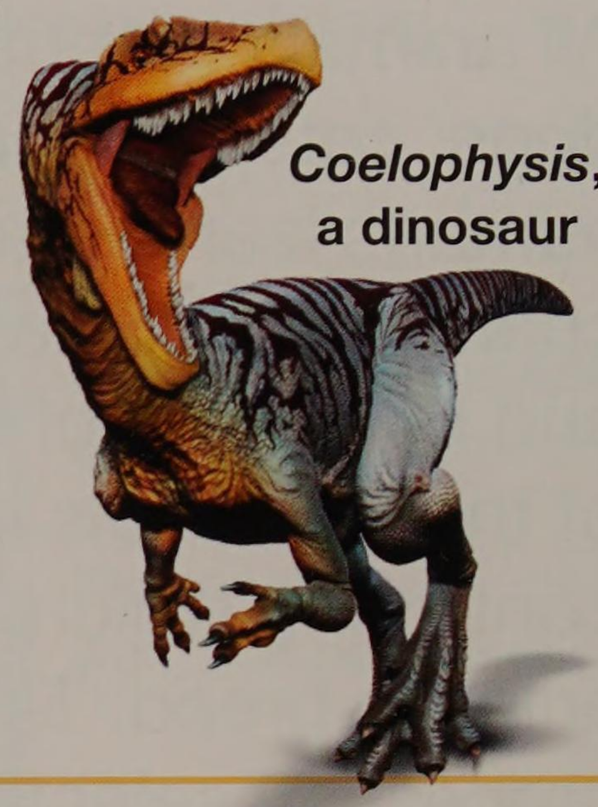
Adaptation

Most animals are adapted to live and reproduce in the environment in which they live – some better than others. The colours of the Argentine horned frog helps it blend in among leaf litter.

Argentine horned frog camouflaged in leaf litter

Extinction

An animal becomes extinct because it cannot adapt quickly enough to the changes in its environment. Around 65 million years ago, an asteroid or comet hit Earth, triggering a series of environmental changes that led to the extinction of the dinosaurs.



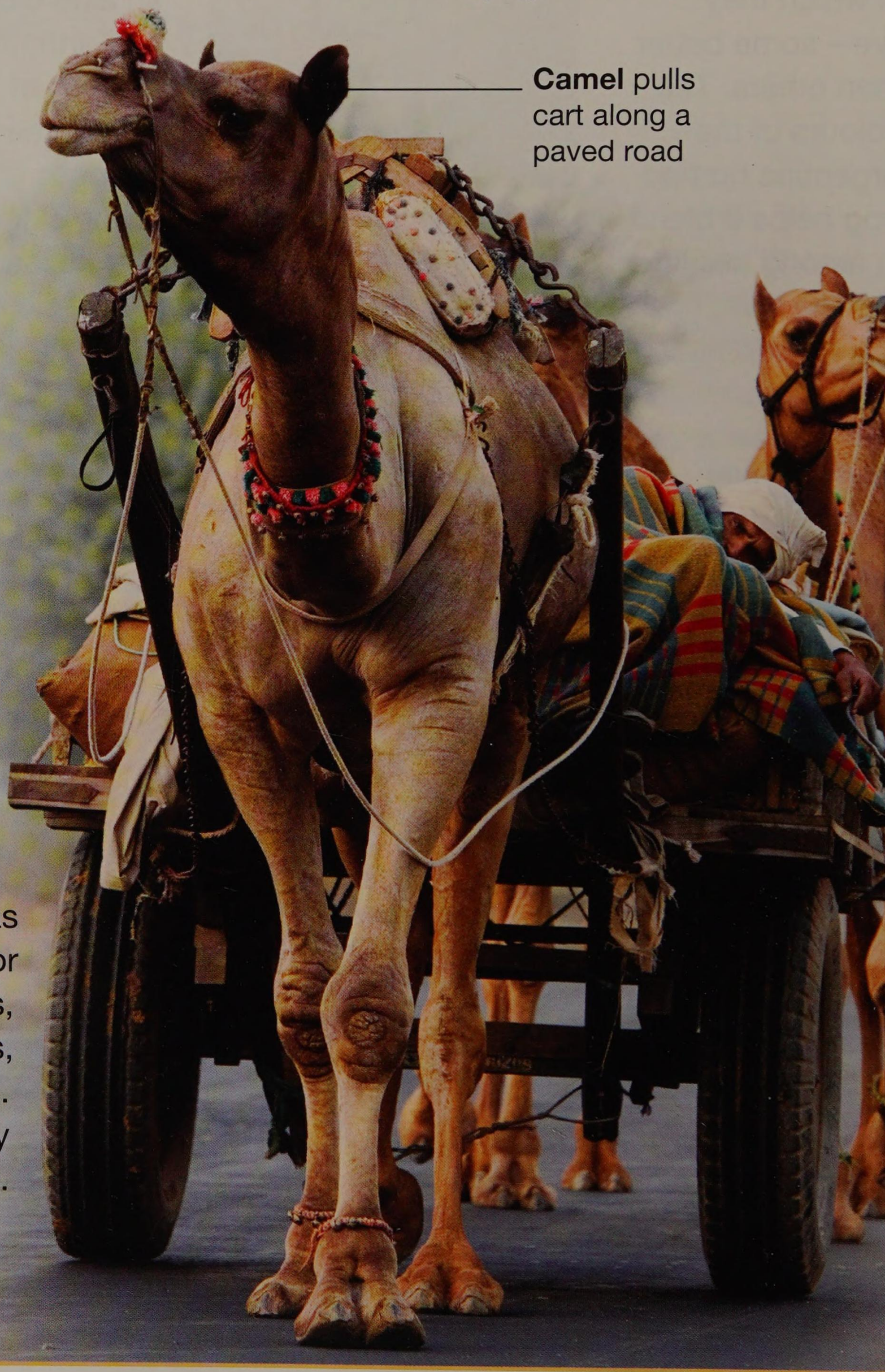
***Coelophysis*, a dinosaur**

Deinotherium

African savanna elephant

Domestic animals

A domestic animal is one that is taken into human care. All animals that have been domesticated today, including dogs, cats, and cattle, were once wild. Over many generations, humans learned to change the bodies and behaviour of many of these animals by controlling which animals breed. This process of selective breeding is known as artificial selection.



Camel pulls cart along a paved road

Workers

Humans value animals for their natural abilities, such as strength. Horses and camels, for example, are used as "mounts" – people ride them for transportation. "Pack" animals, such as donkeys and mules, help carry goods on their back. "Draft" animals, such as heavy horses, pull carts and sledges.

WHERE DO THEY COME FROM?

Humans have domesticated a number of animals for transport, food, and companionship. Many domestic animals have ancestors whose behaviour changed over generations due to human control. The dog was the first animal to be tamed, at least 15,000 years ago.

DOG
Ancestor: Grey wolf
Date: Domesticated between 30,000 BCE and 13,000 BCE
Purpose: Hunting and companionship

HONEY BEE
Ancestor: Genus *Apis*
Date: Domesticated around 3,000 BCE
Purpose: Honey, wax, and pollination

CATTLE
Ancestor: Aurochs
Date: Domesticated around 6,000 BCE
Purpose: Meat, milk, leather, and pulling carts

COCHINEAL INSECT
Ancestor: Cochineal insect
Date: Domesticated around 2,000 BCE
Purpose: Red dye

CHICKEN
Ancestor: Red jungle-fowl
Date: Domesticated some time before 6,000 BCE
Purpose: Meat, eggs, and feathers

GOLDFISH
Ancestor: Asian carp
Date: Domesticated before 1,000 CE
Purpose: Decoration and companionship

Mammals

Mammals are warm-blooded animals, which means that they can maintain a constant body temperature and stay active whatever the weather. Most suckle milk during their early life. They are widespread around the planet. From apes to elephants, many mammals display complex social behaviour, including play – a means of learning and bonding between the young of some mammals.

MARINE MAMMAL
The bottlenosed dolphin has adapted to a life in water. But like other mammals, it breathes air, so must visit the surface every few minutes.

Mammals

These vertebrates feed their young on milk from the female's mammary glands, which give the group its name. Most give birth to live young, while a handful of mammals lay eggs. All mammals grow body hair at some point in their life.

Parenting

Many mammals spend a lot of time and energy in bringing up their young. A mammal's first food is its mother's milk, which contains all the nourishment the young one needs.

Most **primates,** such as these orangutans, carry their young with them until they are old enough to fend for themselves

Types of mammal

There are three types of mammal: the egg-laying monotremes; the pouched mammals, or marsupials; and the placentals. Most mammals belong to the third group.

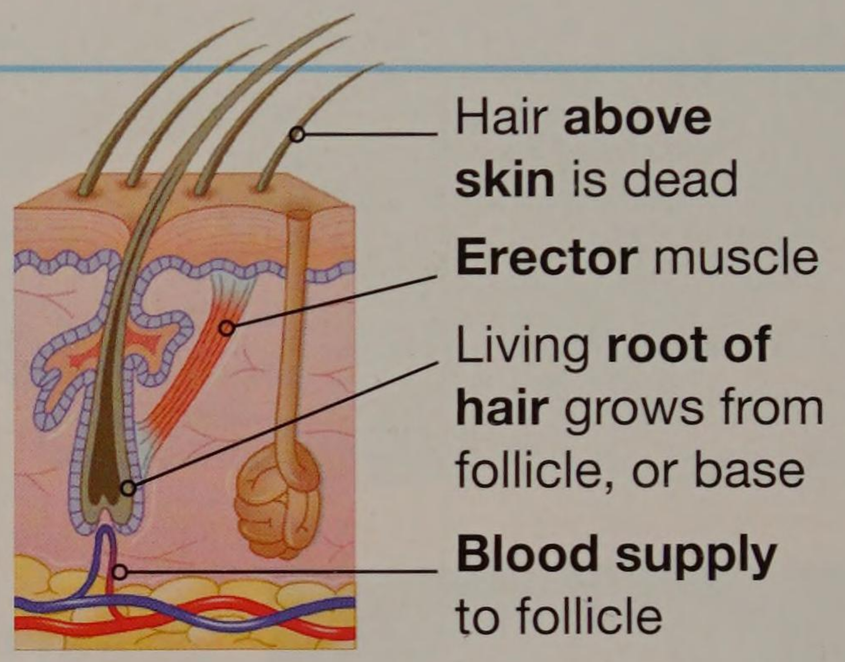
Placentals give birth to live young. They start growing inside the mother, being nourished via a structure called the placenta.

There are only five species of **monotremes.** The short-nosed echidna is one of them.

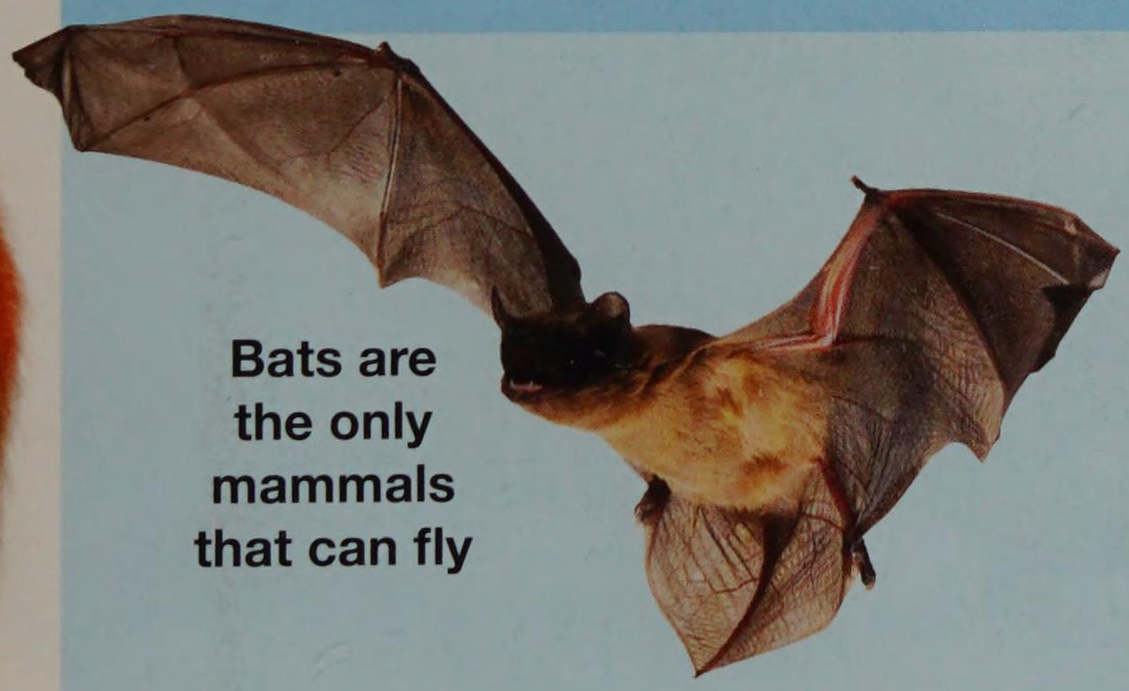
Marsupials give birth at an early stage of the young's development. They are nurtured by the mother's milk inside a pouch attached to her body.

Hair

Hair is unique to mammals. A hairy coat helps maintain a constant body temperature. In cold conditions, each hair is pulled upright, trapping a layer of air near the skin and keeping the mammal warm. It also waterproofs and protects the skin.



SPECIAL ADAPTATIONS



Bats are the only mammals that can fly

A bat's wings are formed from a double layer of skin stretched between the bones of the fingers and arm.

Marine mammals, such as whales, dolphins, and porpoises, evolved from land-living ancestors that took to water. They have flippers instead of arms or legs.

Monotremes and marsupials

Monotremes are the only egg-laying mammals. Marsupials are born at an early stage of development and most complete it in the mother's pouch, nourished by milk.

FOCUS ON...
YOUNG
Marsupials such as opossums need time to develop before leaving their mother.

▲ Newborn babies remain attached to the mother's nipples inside the pouch. They feed on her milk.

▲ As they grow older, the young ones cling to their mother's back using well-developed claws.

▲ After a few months, the young ones spend more and more time outside their mother's pouch, returning at the first sign of danger.

Short-nosed echidna

Tachyglossus aculeatus

Also called the spiny anteater, this monotreme has long spines on its body. It often finds its prey by using the sensors on its long snout, which detect electrical signals emitted from the bodies of its victims.

SIZE 30–45 cm (12–18 in) long

DIET Ants, termites, grubs, and worms

HABITAT Forests, deserts, and open habitats

DISTRIBUTION Australia and New Guinea

Koala

Phascolarctos cinereus

Although it has a large, wide, bearlike face, the koala is not related to bears. It is a marsupial and female koalas have a pouch in which they carry their young. Koalas feed at night, eating about 500 g (1 lb) of eucalyptus leaves, and they doze during the day.

SIZE 65–82 cm (26–32.25 in) long

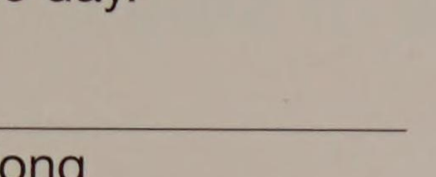
DIET Mainly eucalyptus leaves

HABITAT Forests

DISTRIBUTION Eastern Australia

Duck-billed platypus

Ornithorhynchus anatinus



The duck-billed platypus is a monotreme and has webbed feet that help it to swim. The male platypus uses a poisonous spur on its hind foot to kill prey.

SIZE 40–60 cm (16–23.5 in) long

DIET Invertebrates

HABITAT Rivers and streams

DISTRIBUTION Eastern Australia and Tasmania

Red kangaroo

Macropus rufus

When fleeing from danger, this marsupial bounds on its strong hind legs. It is the largest and swiftest kangaroo and can reach speeds of more than 50 kph (30 mph).

SIZE 1–1.8 m (3.3–6 ft) tall

DIET Grass shoots, herbs, and leaves

HABITAT Mainly savanna

DISTRIBUTION Australia

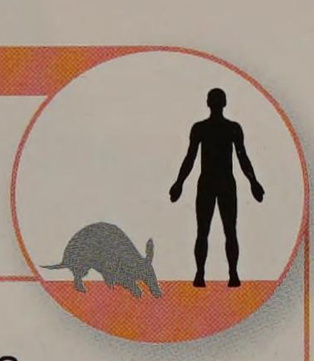
Insect eaters

Moles, shrews, hedgehogs, armadillos, tenrecs, sengis, and aardvarks belong to several unrelated groups of mammal, but they all devour insects. Most of them have a long snout and a keen sense of smell.

FOCUS ON...
FINDING FOOD

Insect eaters look for food using various senses and body parts

Aardvark
Orycteropus afer



A swift burrower, the aardvark uses its shovel-like claws to rip open termite nests. It then inserts its sticky tongue and laps up the insects. Strands of long white hair and small folds of skin in its nostrils filter out dust.

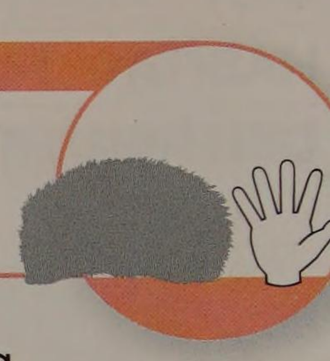
SIZE 1–1.3 m (3.3–4.25 ft) long

DIET Ants and termites

HABITAT Savanna and scrublands

DISTRIBUTION South of the Sahara desert in Africa

Western European hedgehog
Erinaceus europaeus



Covered with spines, this hedgehog curls up into a prickly ball when alarmed. It hibernates in winter – lowering both its body temperature and heart rate to do so.

SIZE 20–30 cm (8–12 in) long

DIET Small animals, birds' eggs, and carrion

HABITAT Woodlands, farmlands, and gardens

DISTRIBUTION Western Europe

▲ The sengi locates food using its long, flexible snout and by digging with its claws.

▲ Giant anteaters rip open termite nests with their sharp claws before starting to snack.

▲ Since they are almost blind, golden moles detect vibrations in sand to find insects.

▲ An aardvark uses its senses of smell and acute hearing to hunt for ants to feed on.

European mole

Talpa europaea

With fur as smooth as silk, the European mole moves easily as it digs tunnels in the soil. Almost blind, it uses its hind feet for support and its front legs to scoop soil to either side of its body.

SIZE 11–16 cm (4.5–6.5 in) long

DIET Worms and other soil animals

HABITAT Meadows, pastures, gardens, and parks

DISTRIBUTION Europe to northern Asia

Eurasian shrew

Sorex araneus

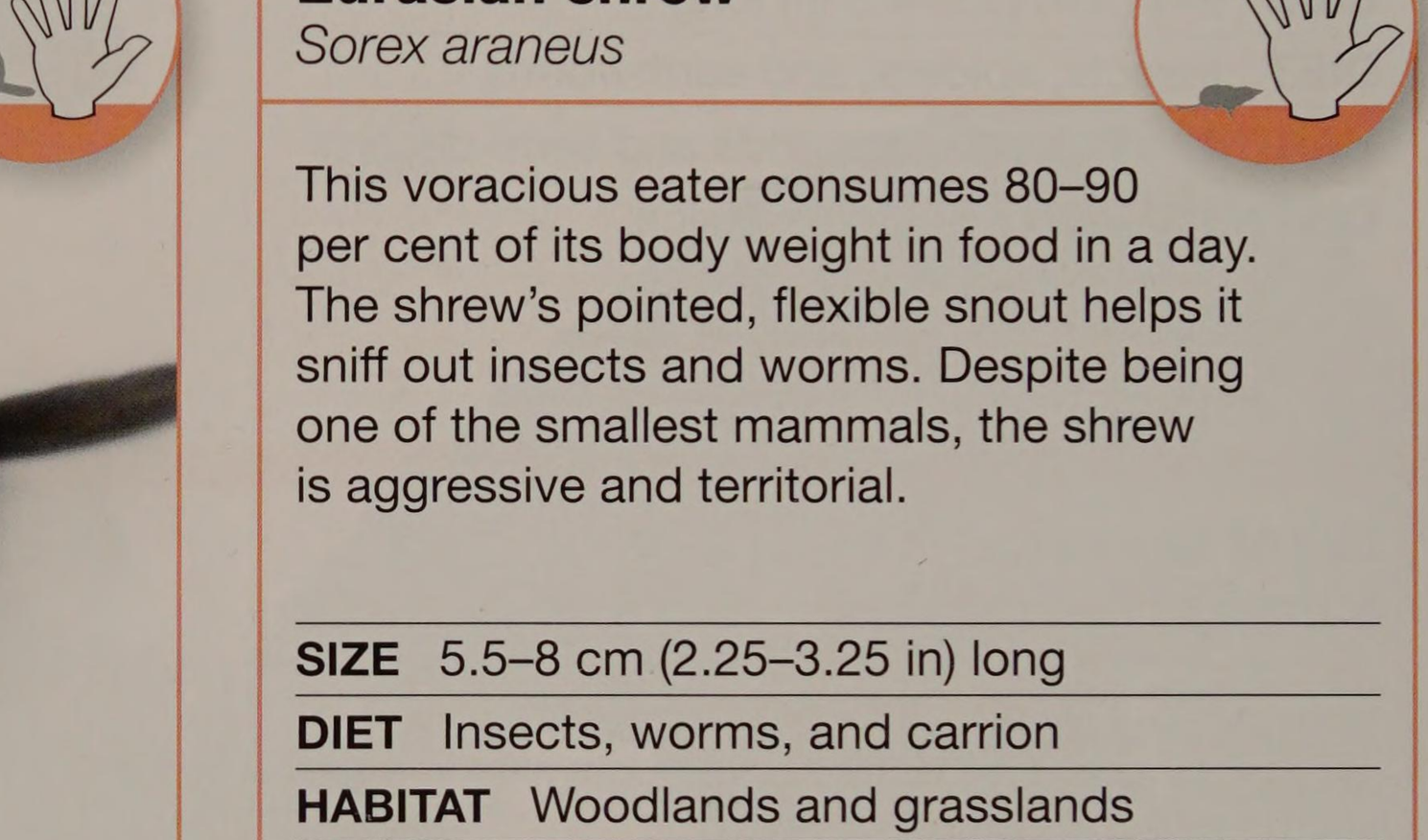
This voracious eater consumes 80–90 per cent of its body weight in food in a day. The shrew's pointed, flexible snout helps it sniff out insects and worms. Despite being one of the smallest mammals, the shrew is aggressive and territorial.

SIZE 5.5–8 cm (2.25–3.25 in) long

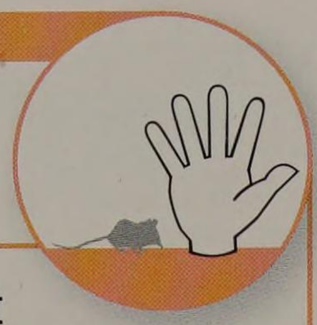
DIET Insects, worms, and carrion

HABITAT Woodlands and grasslands

DISTRIBUTION Europe to northern Asia



Bushveld sengi
Elephantulus intufi



Sengis were once known as elephant shrews due to their long, flexible snout. They live in pairs and occupy territories, defending them against rivals.

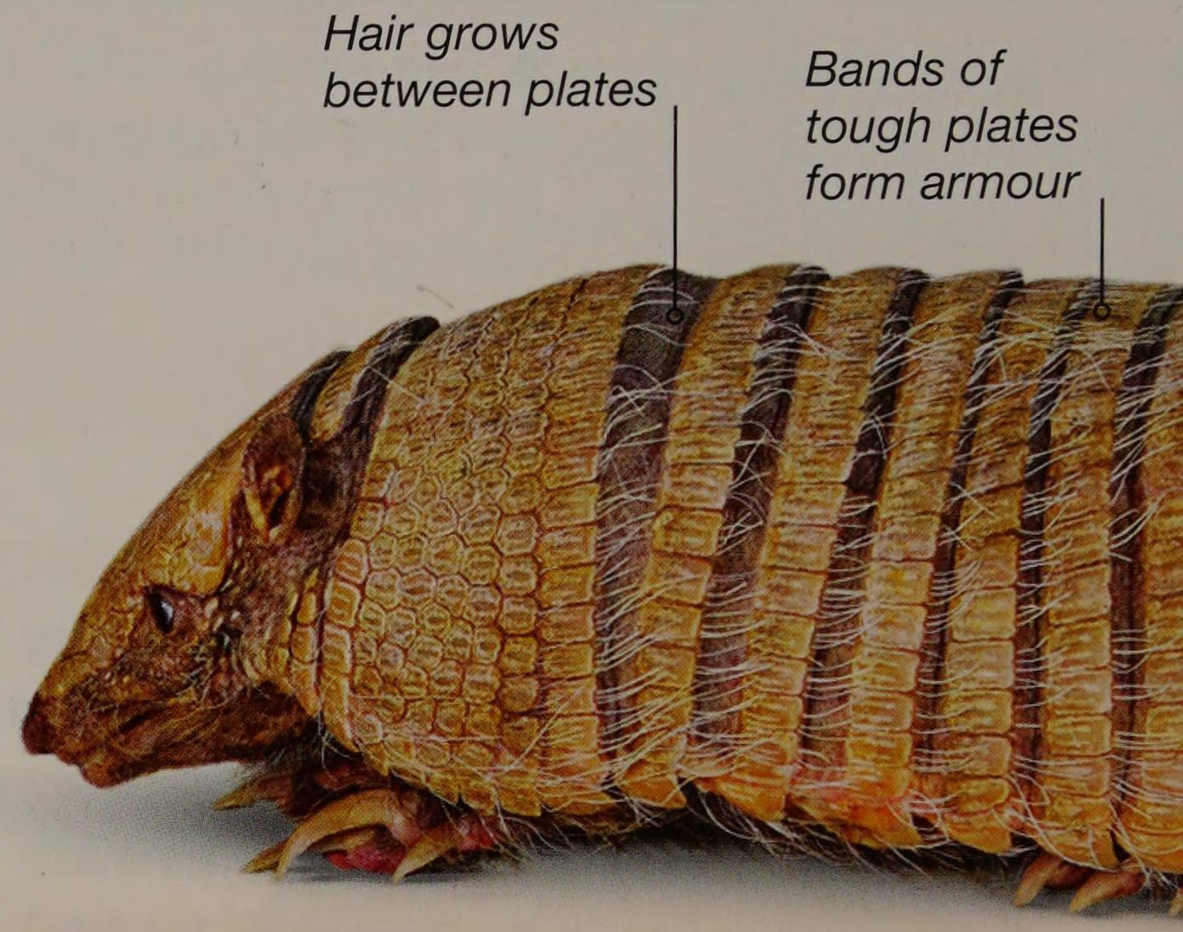
SIZE 9–11 cm (3.5–4.5 in) long

DIET Insects, spiders, and earthworms

HABITAT Steppe grasslands and semi-deserts

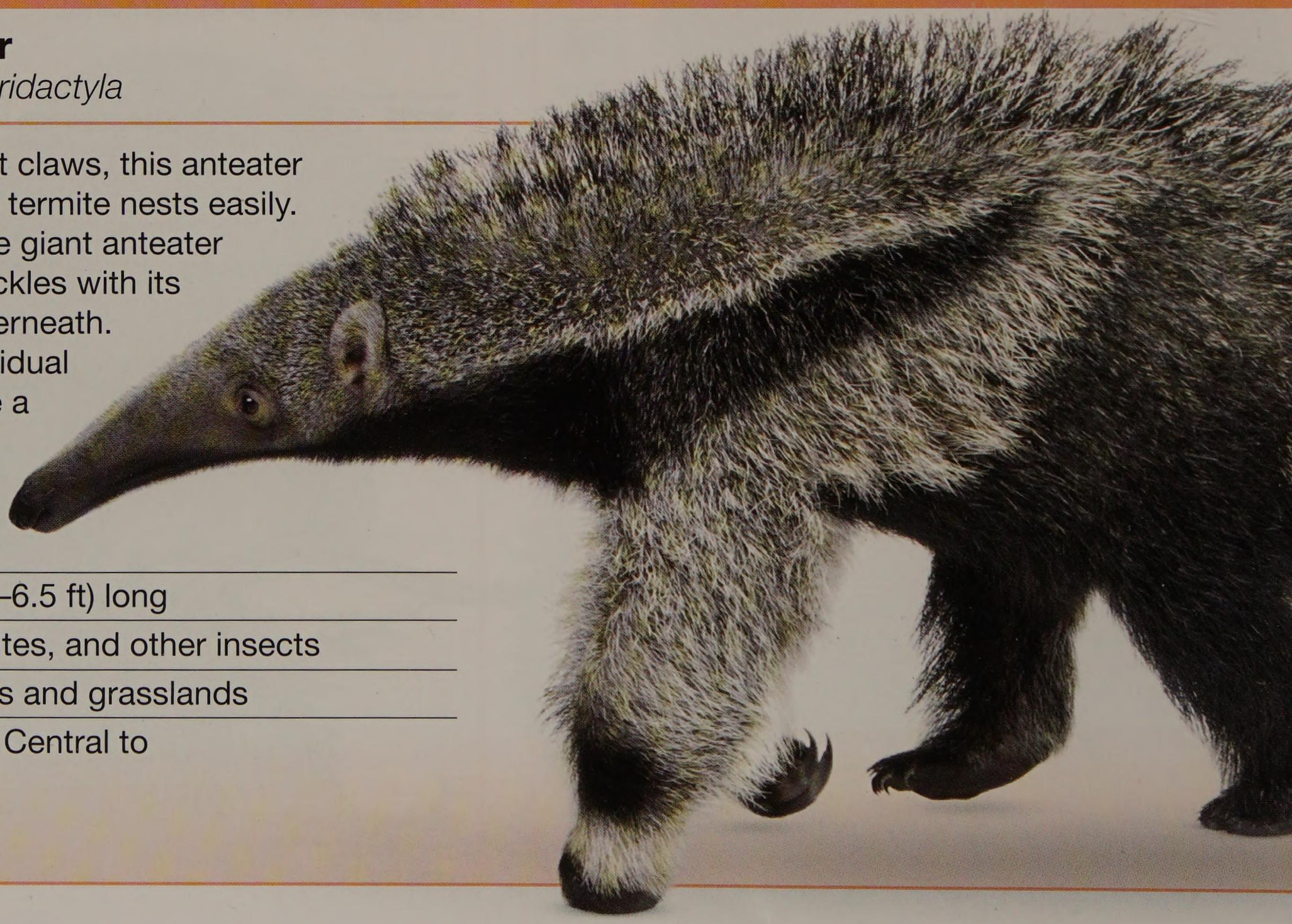
DISTRIBUTION Southern Africa

Six-banded armadillo
Euphractus sexcinctus



Giant anteater
Myrmecophaga tridactyla

With its large front claws, this anteater rips open ant and termite nests easily. When walking, the giant anteater moves on its knuckles with its claws folded underneath. This juvenile individual does not yet have a full-length snout.



SIZE 1–2 m (3.3–6.5 ft) long

DIET Ants, termites, and other insects

HABITAT Forests and grasslands

DISTRIBUTION Central to South America

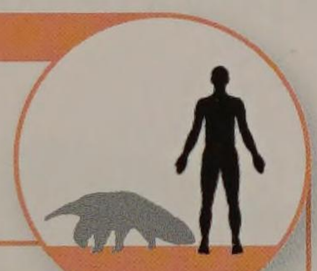
This armadillo is more active during the day than others, which are mostly active at night. It spends most of its day looking for food, using its long, curved claws to dig into hard ground.

SIZE 40–49 cm (16–19.5 in) long

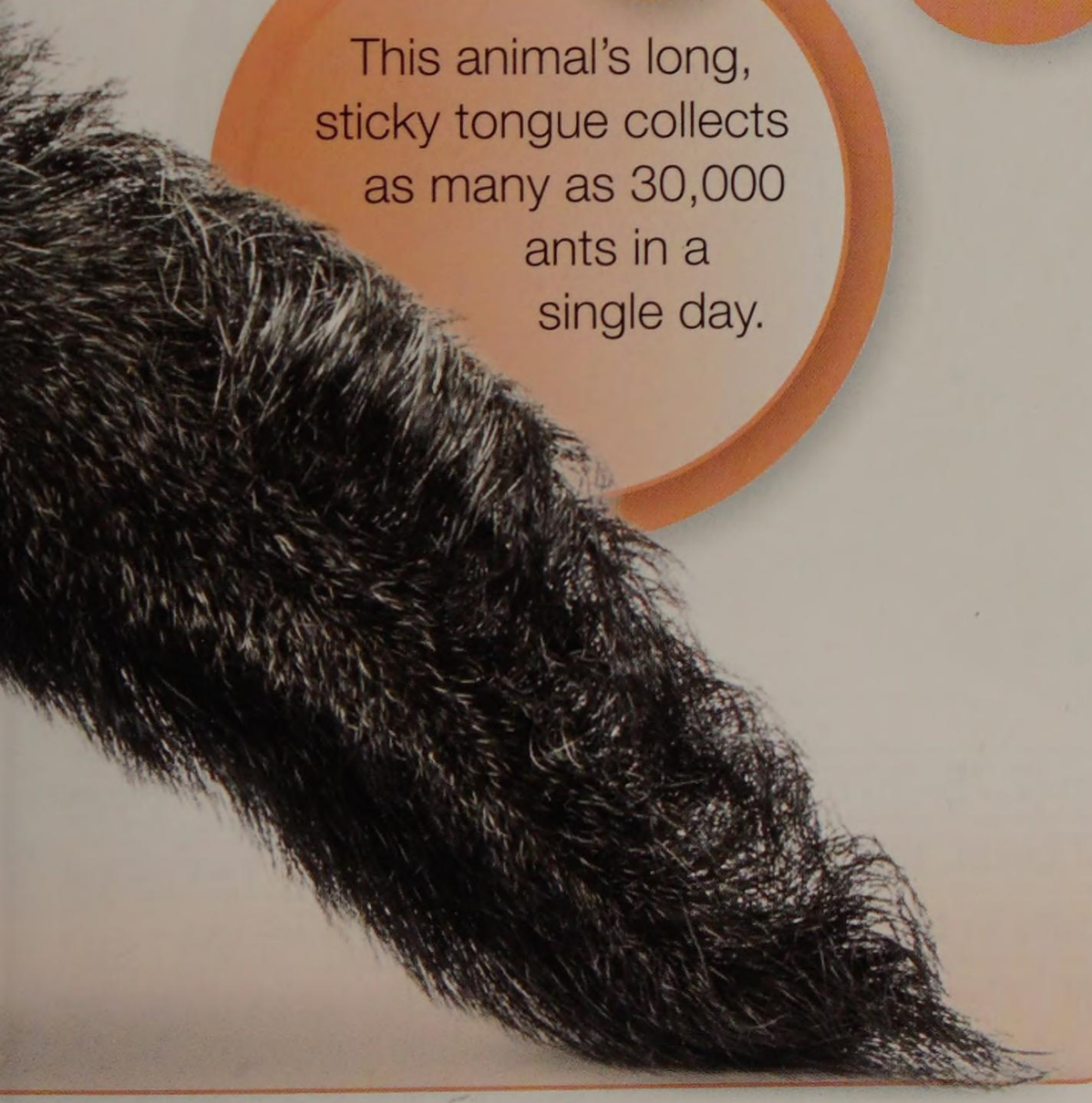
DIET Roots, shoots, invertebrates, and carrion

HABITAT Grasslands and forests

DISTRIBUTION South America



This animal's long, sticky tongue collects as many as 30,000 ants in a single day.



Long-tailed pangolin

Manis tetradactyla

This pangolin's prehensile (grasping) tail measures two-thirds of its total body length. Its bare tip grips branches as the pangolin climbs. The animal has no teeth so it grinds up its food with its tough, muscular stomach.

SIZE 30–40 cm (12–16 in) long

DIET Ants, termites, and other invertebrates

HABITAT Tropical moist forests around rivers and swamps

DISTRIBUTION West Africa

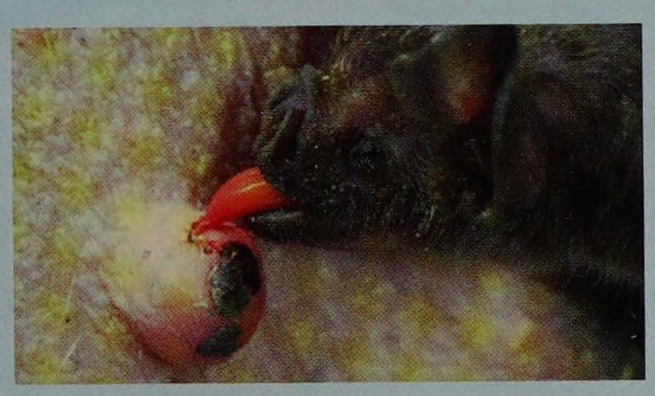
Bats

Bats are the only mammals that can fly. Their wings are formed from skin stretched between the side of the body, arm, and the four long fingers on each hand. While flying, most bats emit chirps that reflect off prey, and the echoes help the bats find their victims.

FOCUS ON...

DIET

Bats are active at night when they look for fruits, insects, and even blood.



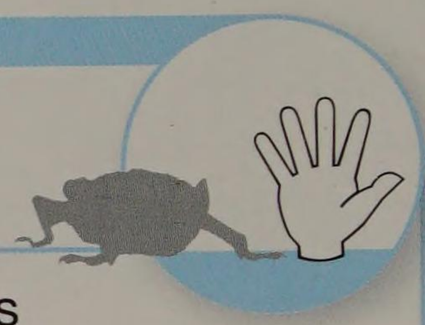
▲ The vampire bat's saliva numbs the skin of its victims so they can't feel the bat's bite.

▲ Many fruit bats have a long tongue that helps them to collect nectar and pollen.

▲ Most bats can catch insects in mid-air and find prey in the dark.

Vampire bat

Desmodus rotundus



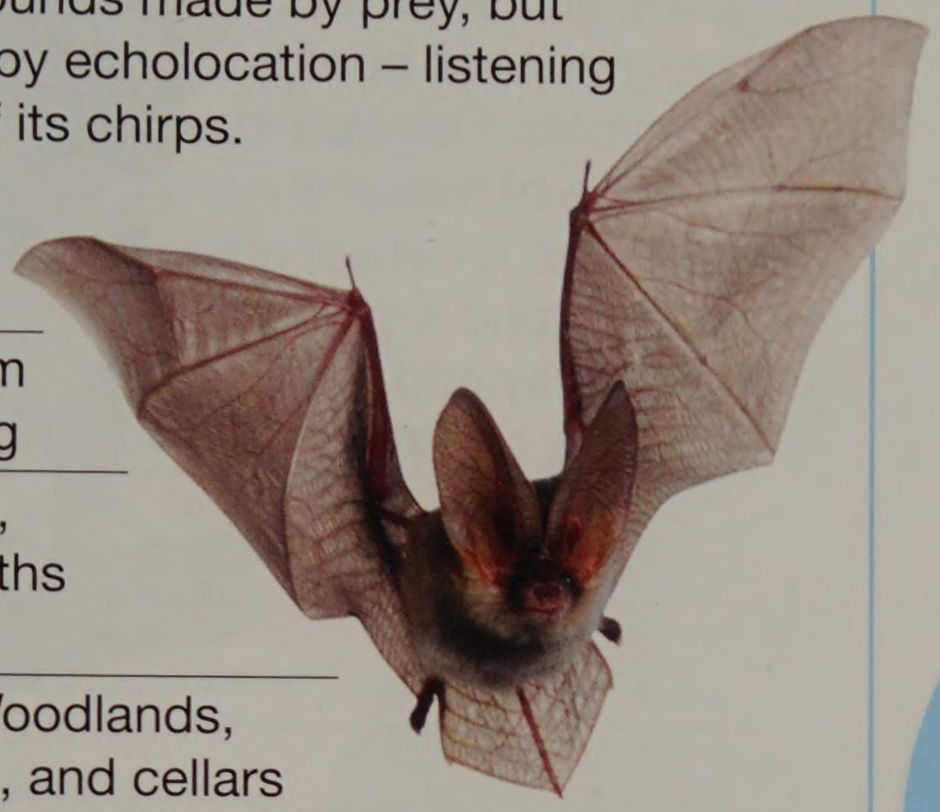
The vampire bat is the only mammal that feeds entirely on blood. It approaches its prey silently and uses its bladelike incisor teeth to cut into the flesh. Its saliva prevents the prey's blood from clotting while it feeds.

SIZE	7–9.5 cm (2.75–3.75 in) long
DIET	Blood of birds, tapirs, or farm animals
HABITAT	Roosts in trees, caves, mines, or old buildings
DISTRIBUTION	Central and South America

Brown long-eared bat

Plecotus auritus

This bat's huge ears are good for picking up sounds made by prey, but it also hunts by echolocation – listening for echoes of its chirps.



SIZE 4–5 cm (1.5–2 in) long

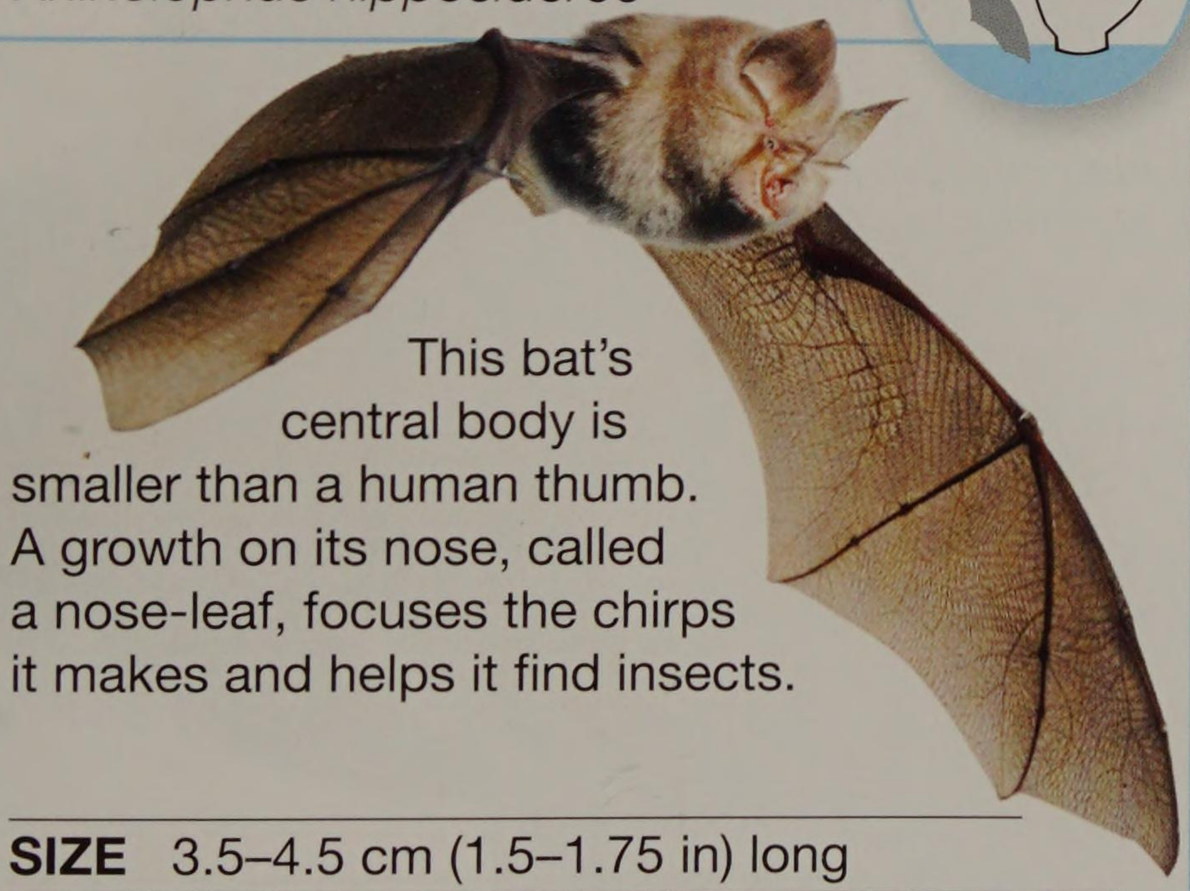
DIET Insects, including moths and beetles

HABITAT Woodlands, caves, mines, and cellars

DISTRIBUTION Europe and central Asia

Lesser horseshoe bat

Rhinolophus hipposideros



This bat's central body is smaller than a human thumb. A growth on its nose, called a nose-leaf, focuses the chirps it makes and helps it find insects.

SIZE 3.5–4.5 cm (1.5–1.75 in) long

DIET Small flying insects

HABITAT Woodlands and scrublands

DISTRIBUTION Europe, Africa, and western Asia

Spectacled flying fox

Pteropus conspicillatus

Fruit bats use their eyesight and sense of smell to locate food. They have claws on both their thumb and second finger. This fruit bat has a ring of pale yellow fur around each eye.

The spectacled flying fox can travel as far as 70 km (43 miles) in search of food.

SIZE 22–25 cm (9–10 in) long

DIET Fruits and flowers

HABITAT Tropical rainforests

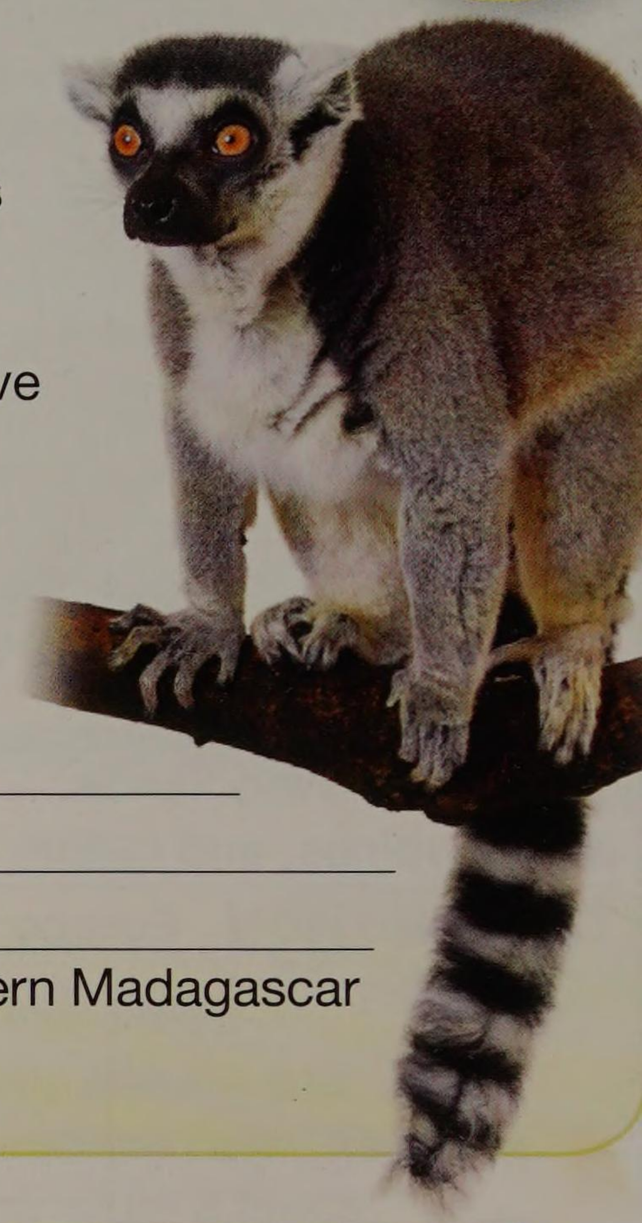
DISTRIBUTION Indonesia's Moluccan Islands, New Guinea, and northeastern Australia

Primates

Lemurs, monkeys, and apes make up most of this group. Most kinds of primate live in tropical rainforests and form families or social groups. Primates have grasping hands and feet that are useful for climbing trees or handling tools. Some primates are remarkably intelligent.

Ring-tailed lemur
Lemur catta

This lemur likes company and lives in large groups of up to 25 animals. Females take charge of the group. Unlike most lemurs, this one is active during the day and feeds on the ground.



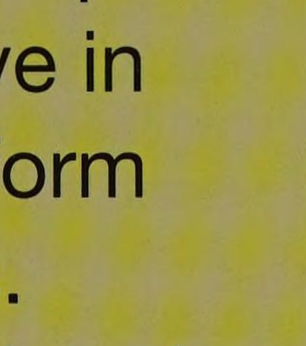
SIZE 51–60 cm (20–23.5 in) long

DIET Fruits

HABITAT Rainforests

DISTRIBUTION Eastern Madagascar

Philippine tarsier
Tarsius syrichta



Of all mammals, Philippine tarsiers have the largest eyes relative to their body size. They sleep in dark hollows during the day and venture out to hunt at night. Their huge eyes help them to see well in the dark.

SIZE 8.5–16 cm (3–6.5 in) long

DIET Insects

HABITAT Rainforests and scrublands

DISTRIBUTION Philippines

Common marmoset
Callithrix jacchus

This unusual monkey has clawlike nails that help it cling vertically to tree trunks and run on all fours along branches. It is one of the "New World monkeys", meaning it lives in the Americas.

SIZE 12–15 cm (4.75–6 in) long

DIET Fruits, flowers, nectar, and small animals

HABITAT Forests

DISTRIBUTION Northeastern Brazil

Mandrill

Mandrillus sphinx

The largest monkeys in the world, mandrills spend most of their time on the ground looking for food. They only climb trees to sleep at night. Males yawn widely when threatened, displaying their fearsome teeth.

SIZE 63–81 cm (25–32 in) long

DIET Fruits, eggs, and small animals

HABITAT Rainforests

DISTRIBUTION
West central Africa

Scarlet nose and blue ridges on the face are unique to mandrills

Mandrill troops may have more than 100 members.

Long, powerful arms

Like humans,

Japanese macaques can develop different accents depending on where they live

JAPANESE MACAQUES

Japanese macaques, also called snow monkeys, have several types of behaviour that remind us of humans. Many take a dip in hot springs to keep themselves warm, and others have been seen washing mud off their food, even seasoning it by dipping it in sea water.

Rodents and rabbits

Rodents are found worldwide and have long tails and a pair of incisor teeth specialized for gnawing. Rabbits, and their relatives hares and pikas, share many features with rodents but have a lighter skull and a second set of incisors that are set directly behind the first pair.

Crested porcupine

Hystrix cristata

The spines of porcupines are actually hair made up of keratin – a substance also found in horns and nails. The crested porcupine often raises its sharp spines when threatened, warning predators about a painful jab.

SIZE 60–100 cm (23.5–40 in) long

DIET Fruits and carrion

HABITAT Savanna grasslands, forests, and rocky terrain

DISTRIBUTION Northern Africa, as far south as Tanzania

Eastern grey squirrel
Sciurus carolinensis

The eastern grey squirrel spread from North America to parts of Europe where it is now replacing the native red squirrel. This agile animal has an active memory that helps it to locate food hoarded previously.

SIZE 23–30 cm (9–12 in) long

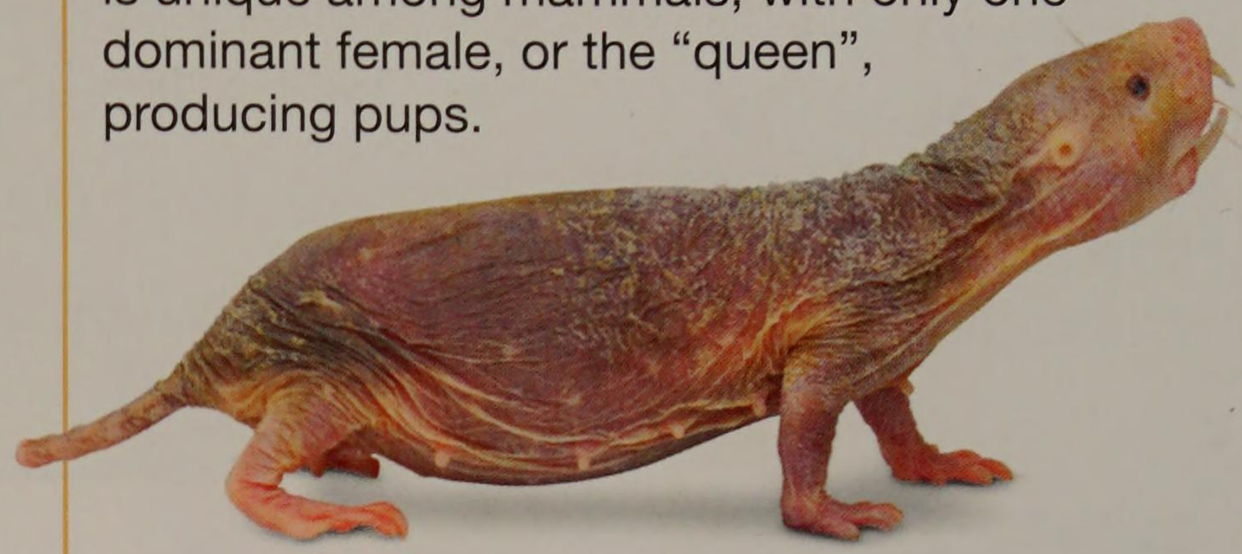
DIET Nuts, seeds, flowers, and fruits

HABITAT Forests and urban areas

DISTRIBUTION Canada and USA; introduced to Europe

Naked mole-rat
Heterocephalus glaber

This bizarre rodent lives underground in huge communal burrows. Its social system is unique among mammals, with only one dominant female, or the "queen", producing pups.



SIZE 8–10 cm (3.25–4 in) long

DIET Roots, bulbs, and underground plant parts

HABITAT Deserts and semi-deserts

DISTRIBUTION East Africa

Brown rat
Rattus norvegicus

Brown rats have a keen sense of smell, and they can smell food more than 3 km (1.87 miles) away while foraging at night. Rats in a pack find each other by smell.

SIZE 21–29 cm (8.5–11.5 in) long

DIET Almost anything

HABITAT Grasslands and urban areas

DISTRIBUTION Worldwide, except polar regions

European hare
Lepus europaeus

These hares live alone and are active at night. However, in spring they gather for a "boxing" courtship where females fight off males until they are ready to mate.

SIZE 48–70 cm (19–28 in) long

DIET Grass, herbs, bark, and rarely carrion

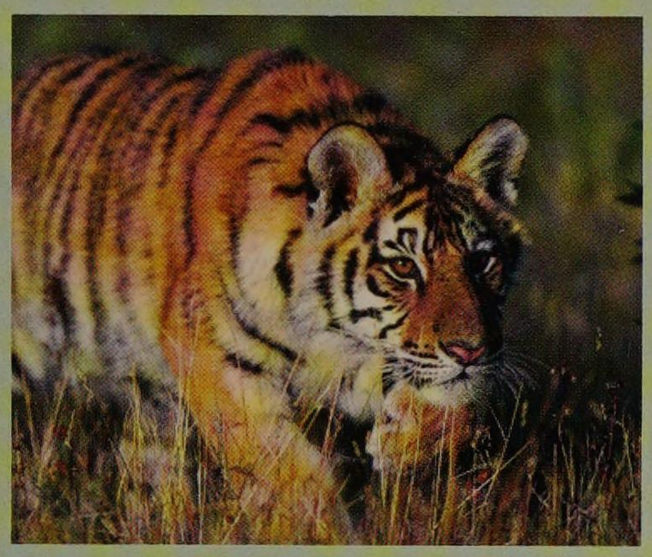
HABITAT Open woods, bush, and grasslands

DISTRIBUTION Europe; introduced to Australia, New Zealand, and North America

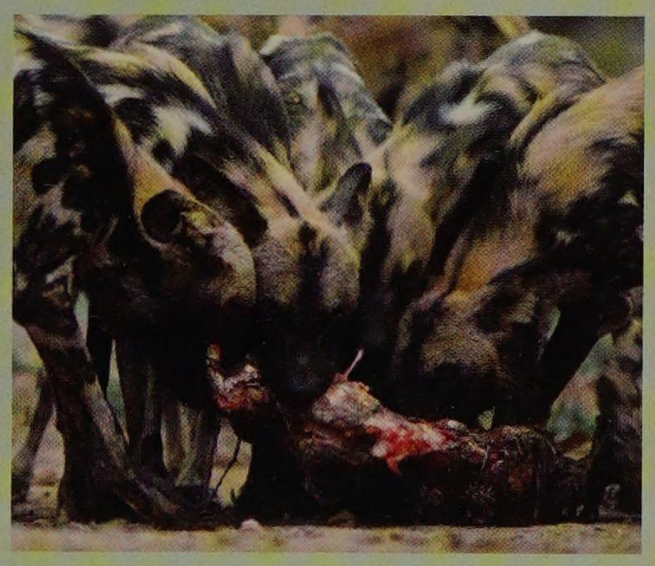
Carnivores

The carnivores, meaning meat eaters, are grouped together not because they are all predators, although most of them are, but because they are all related. Most carnivores are fast runners with a flexible spine and sharp teeth that help them tear flesh.

FOCUS ON...
HUNTING
Most cats are lone hunters that use stealth tactics to catch prey, while dogs chase prey in a group.



▲ A tiger stalks its prey. It gets as close as possible to its prey and then gives it a short chase to get close enough to pounce.

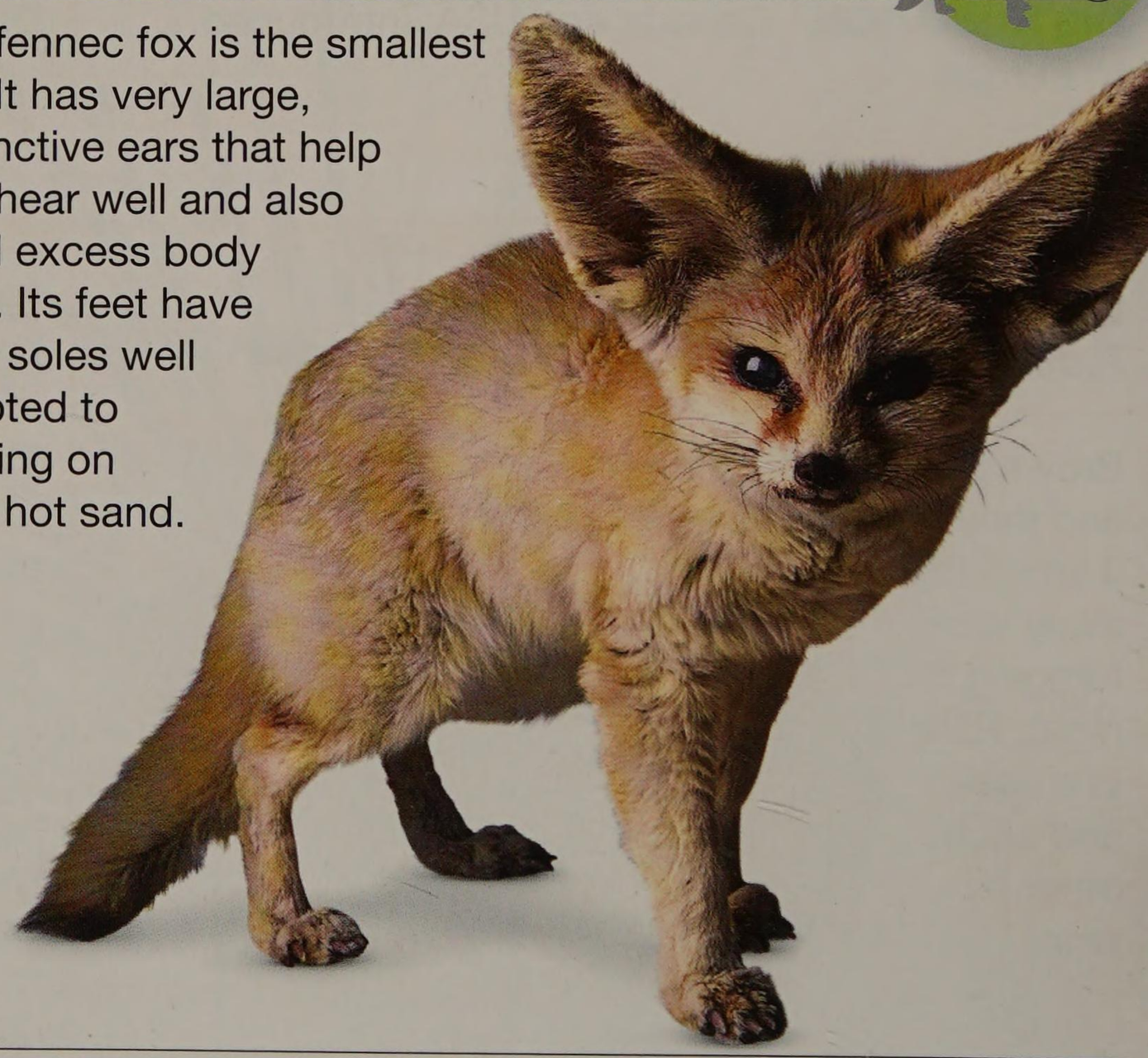


▲ Wild dogs hunt in a pack, which allows them to catch prey larger than themselves. They run down prey in a long-distance endurance chase.

Fennec fox

Vulpes zerda

The fennec fox is the smallest fox. It has very large, distinctive ears that help it to hear well and also shed excess body heat. Its feet have furry soles well adapted to walking on soft, hot sand.



SIZE 33–41 cm (13–16 in) long

DIET Fruits, seeds, eggs, termites, and lizards

HABITAT Deserts

DISTRIBUTION Northern Africa

Polar bear
Ursus maritimus

One of the largest land predators, a polar bear has a keen sense of smell and can detect seals from 1 km (0.6 miles) away, even when the seals are hidden in their birth lairs underneath 1 m (3.3 ft) of hardened snow.

SIZE 1.8–2.8 m (6–9 ft) long

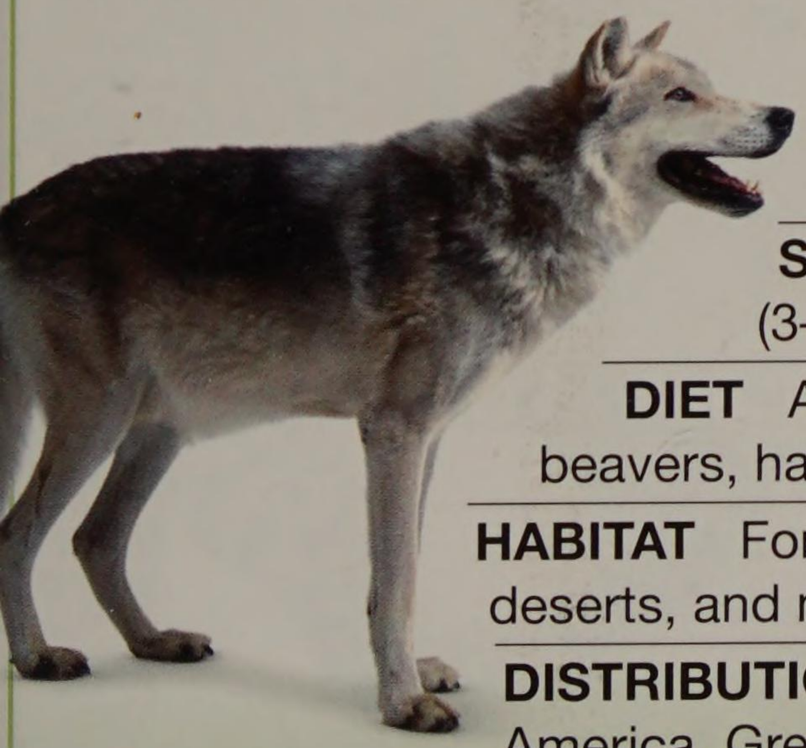
DIET Seals, birds' eggs, lemmings, mosses, and carrion, such as caribou and musk oxen

HABITAT Arctic ice fields

DISTRIBUTION Arctic Ocean and polar parts of Russia, Alaska, Canada, Norway, and Greenland

Grey wolf
Canis lupus

The largest member of the dog family, the grey wolf forms packs to hunt animals. As a group, they can take down prey as large as a bison. Packs are led by a dominant pair.



SIZE 0.9–1.6 m (3–5.25 ft) long

DIET Animals, such as beavers, hares, and elk

HABITAT Forests, tundra, deserts, and mountains

DISTRIBUTION North America, Greenland, Europe, and Asia

Red panda
Ailurus fulgens

The red panda has claws that can be partly drawn in. It is a good climber. Active mainly during the night, it communicates by making shrill cries, whistles, and squeaks. It marks its territory with urine, droppings, and a musklike scent.

SIZE 50–73 cm (20–29 in) long

DIET Plant matter, birds' eggs and chicks, small mammals, and birds

HABITAT Dense temperate mountain forests

DISTRIBUTION Himalayas

Lion
Panthera leo

Lions are the only cats that live in groups, called prides. They are often seen napping under trees. Since they have no natural predators, they are perfectly safe sleeping in the open.

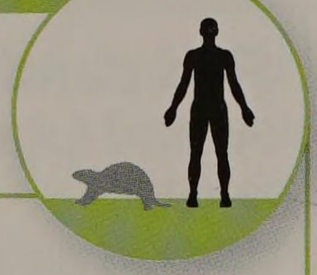
SIZE 1.6–2.5 m (5.25–8.25 ft) long

DIET Large animals, such as zebras, impalas, and buffalos

HABITAT Tropical forests, savanna, and deserts

DISTRIBUTION Africa and India

Sea otter
Enhydra lutris



The smallest marine mammal, the sea otter lives at sea for most of its life and comes ashore rarely. It feeds on clams, which it breaks open with a stone that it carries around with it.

SIZE 0.75–1.2 m (2.5–4 ft) long

DIET Fish and clams

HABITAT Kelp forests

DISTRIBUTION
North Pacific

Leopard
Panthera pardus

This cat is an adept climber and often spies on its prey from high in trees. Using its immense strength, this animal drags its kill up the tree to keep it from being stolen.

SIZE 0.9–1.9 m (3–6.25 ft) long

DIET Small antelopes

HABITAT Forests, mountains, deserts, and grasslands

DISTRIBUTION
Africa and southern Asia

Caracal
Caracal caracal

The caracal can spring and jump exceptionally well, sometimes as high as 3 m (10 ft). Amazingly, it can snatch a flying bird with its paw. It is also called the desert lynx.

SIZE 0.6–1.06 m (2–3.5 ft) long

DIET Rodents and small animals

HABITAT Dry scrublands

DISTRIBUTION Africa and Asia

Least weasel
Mustela nivalis

The least weasel has a chestnut coat that turns white in winter. This helps it to blend in better with its snowy home. Its small, flattened head is ideal for entering mouse burrows.

SIZE 11–26 cm (4.25–10 in) long

DIET Mainly mice

HABITAT Forests, mountains, grasslands, and Arctic tundra

DISTRIBUTION North America, Europe, and northern, central, and eastern Asia

Despite being the smallest carnivore, the least weasel can kill a rabbit 10 times its own weight.

At up to 300 kg (675 lb), the Siberian tiger is the world's heaviest cat, weighing as much as

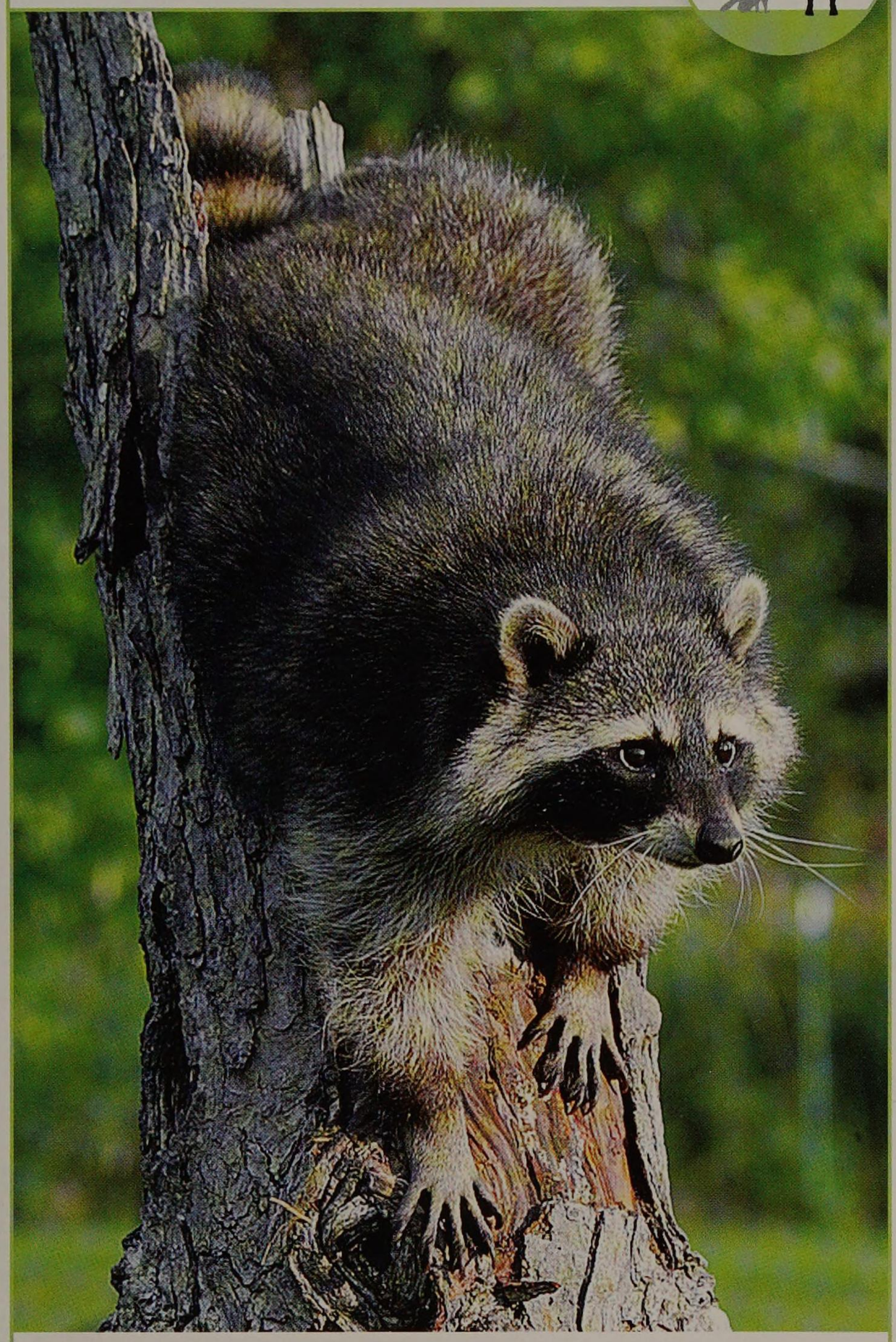
four adult men

SIBERIAN TIGER

The Siberian tiger is the subspecies living in the cold climate of far eastern Russia and nothernmost China. This cat has evolved a thick fur coat and layer of fat around its belly and flanks, which help it to keep warm in the low Siberian temperatures. The animal seen here is an immature male.

Raccoon

Procyon lotor



Raccoons are clever enough to open doors and latches using their agile front paws, while looking for food. They are also known to rub their food clean or rinse it before eating.

SIZE 44–62 cm (17.5–24.5 in) long

DIET Fruits, small mammals, and invertebrates

HABITAT Mainly woodlands and scrublands

DISTRIBUTION South Canada to Central America

Striped skunk

Mephitis mephitis

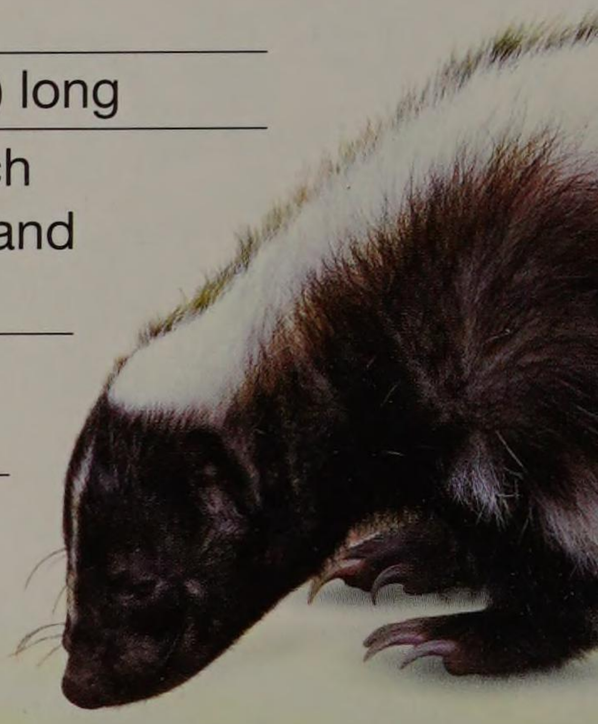
Skunks spray a nasty smelling liquid if threatened. The odour of the spray is so strong that people can smell it from even 1 km (0.6 miles) away. The striped skunk likes to live alone, but may come together in groups in winter burrows.

SIZE 23–40 cm (9–16 in) long

DIET Small animals, such as mice, squirrels, frogs, and insects; also refuse

HABITAT Forests and open habitats

DISTRIBUTION Canada to Mexico



Meerkat

Suricata suricatta

These friendly mongooses live in groups. When a group is out hunting during the day, some meerkats stand guard. They warn the group if a predator is nearby. All the group then dives for cover.

SIZE 24–35 cm (9.5–14 in) long

DIET Mainly insects and scorpions

HABITAT Deserts and semi-deserts

DISTRIBUTION Southern Africa

Walrus

Odobenus rosmarus

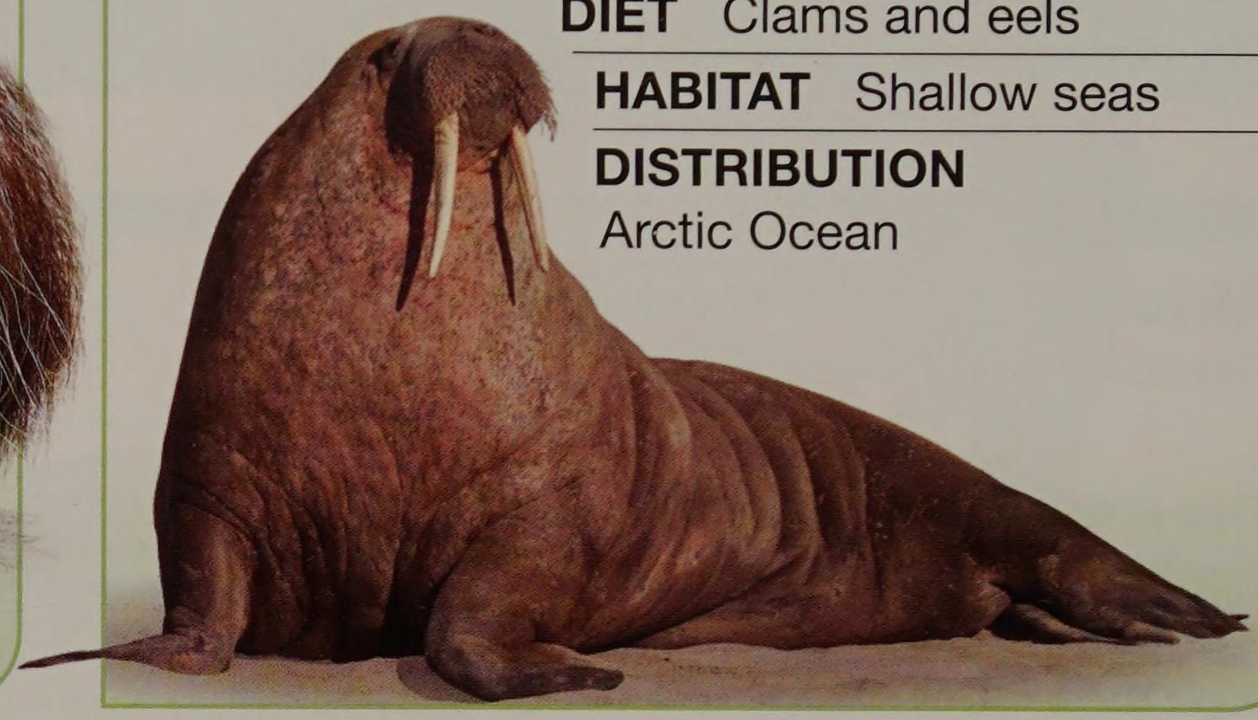
This enormous seal uses its tusks to haul itself out of water. The tusks are actually teeth that can grow up to nearly 1 m (3.3 ft). The male walrus also uses its tusks to compete for mates.

SIZE 2.3–3.6 m (7.5–12 ft) long

DIET Clams and eels

HABITAT Shallow seas

DISTRIBUTION
Arctic Ocean



Common seal

Phoca vitulina

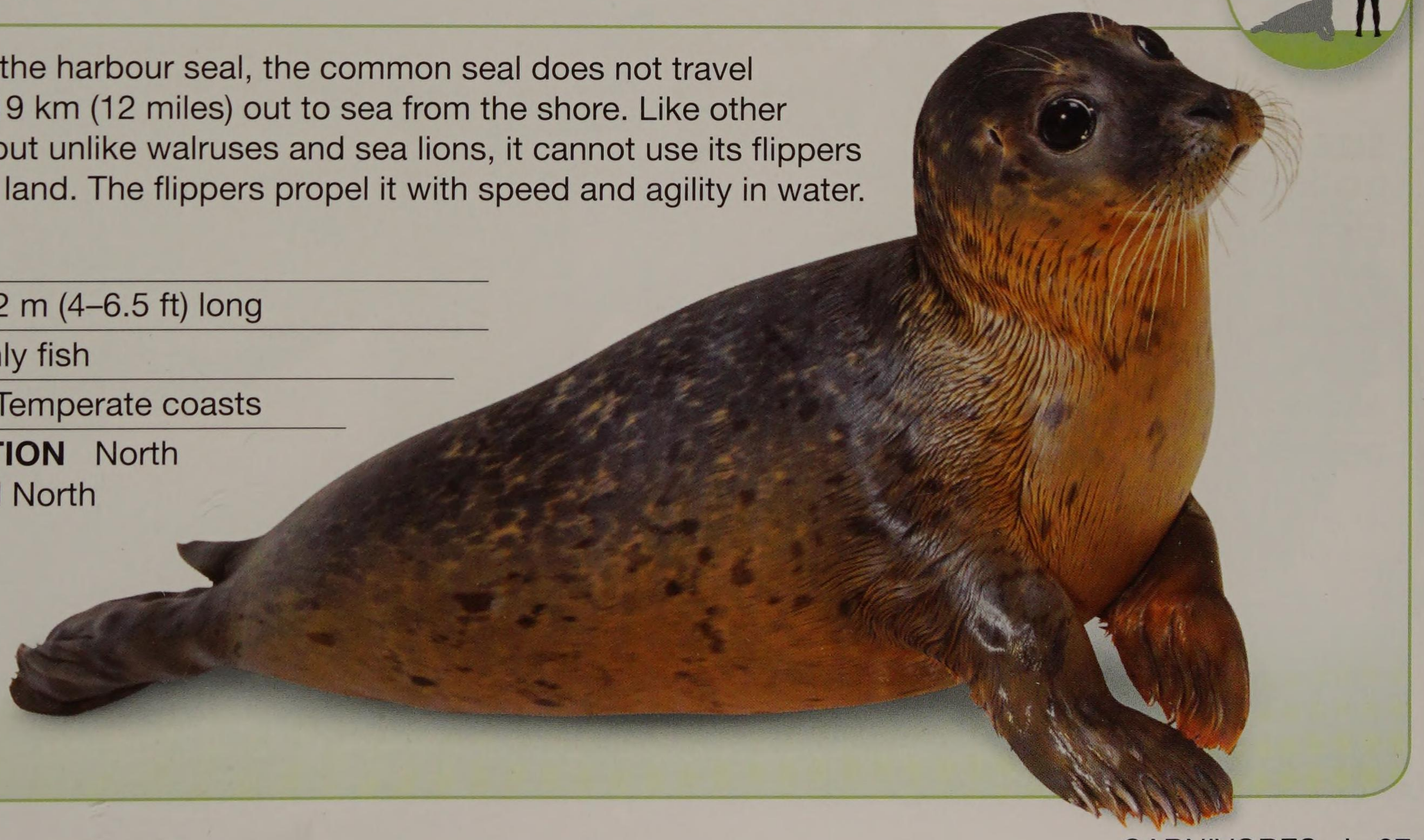
Also called the harbour seal, the common seal does not travel more than 19 km (12 miles) out to sea from the shore. Like other true seals, but unlike walruses and sea lions, it cannot use its flippers to move on land. The flippers propel it with speed and agility in water.

SIZE 1.2–2 m (4–6.5 ft) long

DIET Mainly fish

HABITAT Temperate coasts

DISTRIBUTION North Atlantic and North Pacific

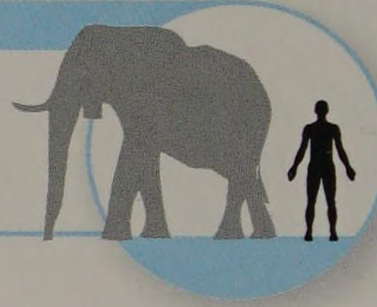


Elephants

Elephants are the largest land animals. They live in close-knit family groups led by the oldest female. These animals have pillarlike legs, large ears, a mobile trunk, and specialized incisor teeth in the form of tusks. They can live for as long as 70 years.

African savanna elephant

Loxodonta africana



This is the largest of the three elephant species. A single adult eats around 135 kg (300 lb) of food a day. These elephants have forward-curving tusks that are sometimes used to loosen mineral-rich soil that is then eaten for the salt.

SIZE 3–3.6 m (10–12 ft) tall

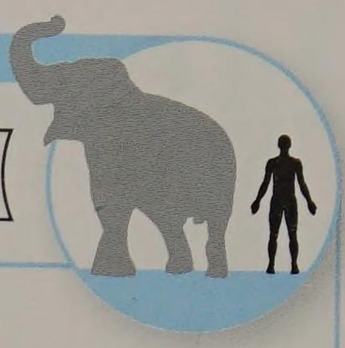
DIET Bark, leaves, and grass

HABITAT Grasslands, deserts, mountains, and rainforests

DISTRIBUTION Africa

Asiatic elephant
Elephas maximus

ENDANGERED



Asiatic elephants have smaller ears than African elephants. Their numbers are rapidly dwindling because their forest homes are being destroyed. Fewer than 60,000 of these elephants may be alive today. These animals have small tusks that may be absent in the females.

SIZE 2–3.6 m (6.5–12 ft) tall

DIET Bark, leaves, and grass

HABITAT Savanna and open forests

DISTRIBUTION Southern and southeast Asia

Five toenails on each forefoot and four on each hind foot

African forest elephant
Loxodonta cyclotis

ENDANGERED

Some experts think this elephant is part of the same species as the African savanna elephant, while others regard it as a separate species. As well as being smaller, it has darker skin and more rounded ears. Its tusks are relatively straight and point downwards, helping the elephant to move freely in dense vegetation.

SIZE 2–2.5 m (6.5–8.25 ft) tall

DIET Barks, leaves, branches, grass, and fruits

HABITAT Deep rainforests

DISTRIBUTION West and central Africa

Hoofed mammals

Mammals with hooves fall into two natural groups, the odd-toed horses and rhinos and the even-toed pigs, deer, antelopes, and relatives. These plant eaters have grinding cheek teeth and a specialized gut.

FOCUS ON...

TOES

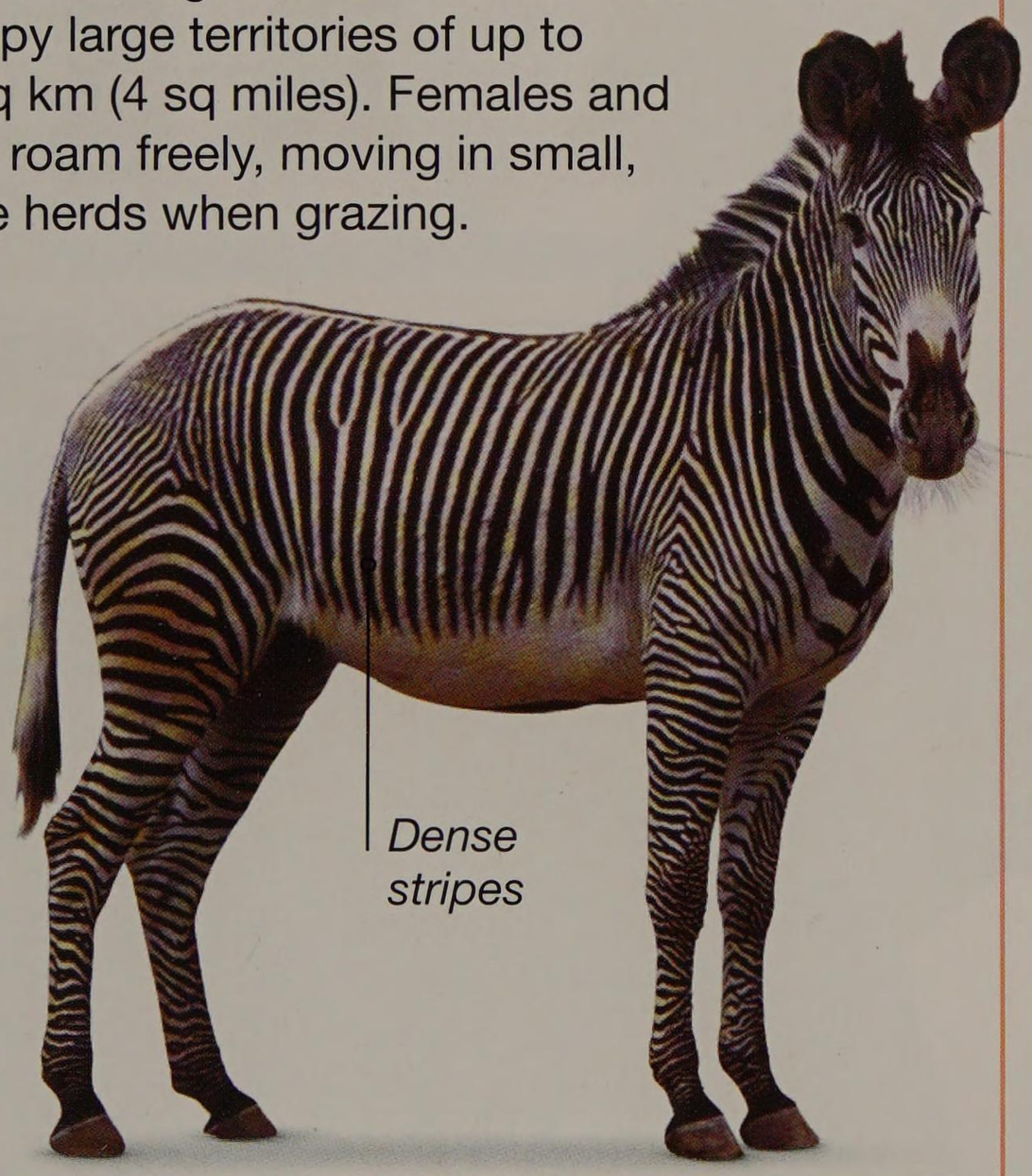
The number of toes is the key feature defining the different hoofed animal groups.

Grevy's zebra

Equus grevyi

ENDANGERED

This is the largest of all zebras. Males occupy large territories of up to 10 sq km (4 sq miles). Females and foals roam freely, moving in small, loose herds when grazing.



SIZE 1.5–1.6 m (5–5.25 ft) tall at shoulder

DIET Mainly grass

HABITAT Grasslands and deserts

DISTRIBUTION East Africa

White rhinoceros

Ceratotherium simum

This is the largest rhinoceros as well as the most numerous. Like other rhinoceroses, this hoofed mammal also loves to wallow in mud to cool down and protect its skin from the Sun. Males are lone grazers and highly territorial.

SIZE 1.5–1.9 m (5–6.25 ft) tall at shoulder

DIET Grass

HABITAT Savanna

DISTRIBUTION Central and southern Africa

▲ Three toes on each foot of a rhinoceros help bear its weight.

▲ A hoof covers the single toe on each foot of a horse.

▲ A pig has four toes, of which the two larger ones bear its weight.

▲ A deer's foot is like a pig's, but the pair of smaller toes are shorter.

This rhinoceros gets its name from the Afrikaans word *weit*, meaning "wide" – a reference to its mouth.

Warthog

Phacochoerus africanus

This wild pig species uses its tough teeth or lips to nip off grass, and roots for juicy underground stems with its snout.

SIZE 64–85 cm (25–33.5 in) tall at shoulder

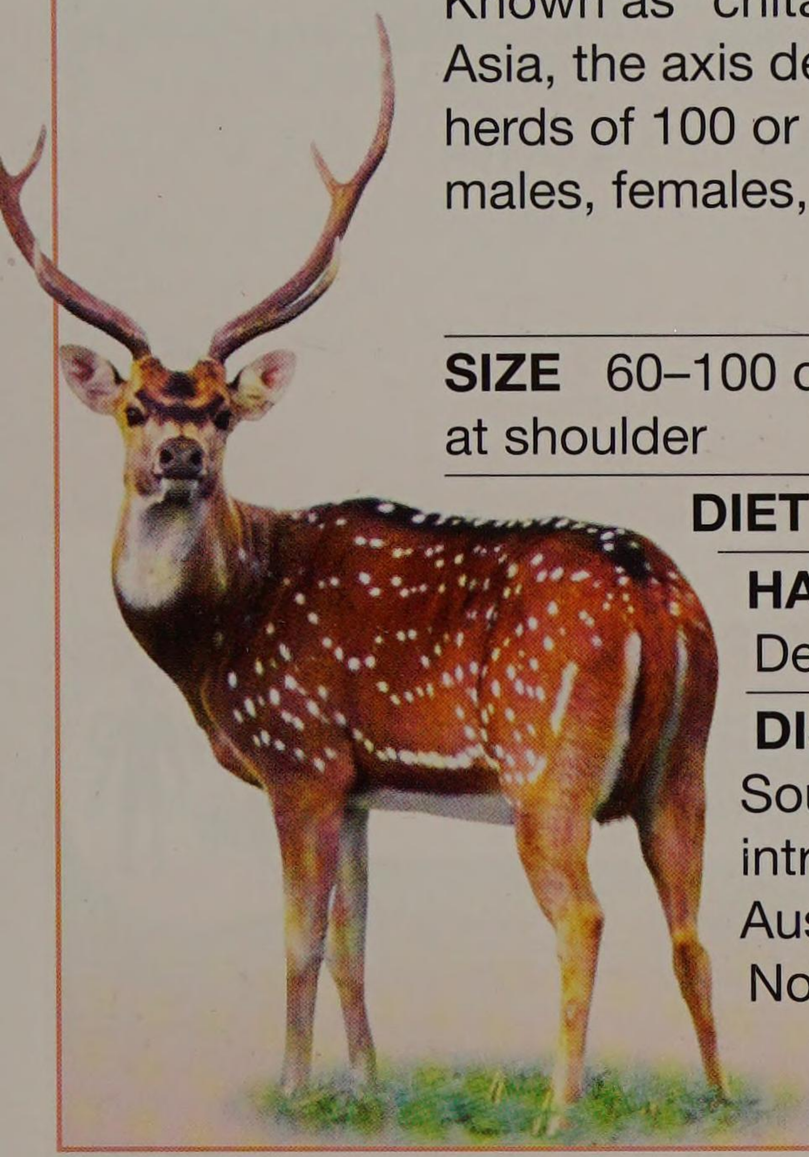
DIET Grass and underground stems

HABITAT Open woodlands, savanna, and scrublands

DISTRIBUTION South of the Sahara in Africa

Axis deer
Axis axis

Known as "chital" in Asia, the axis deer lives in large herds of 100 or more, including males, females, and young.



SIZE 60–100 cm (23.5–40 in) tall at shoulder

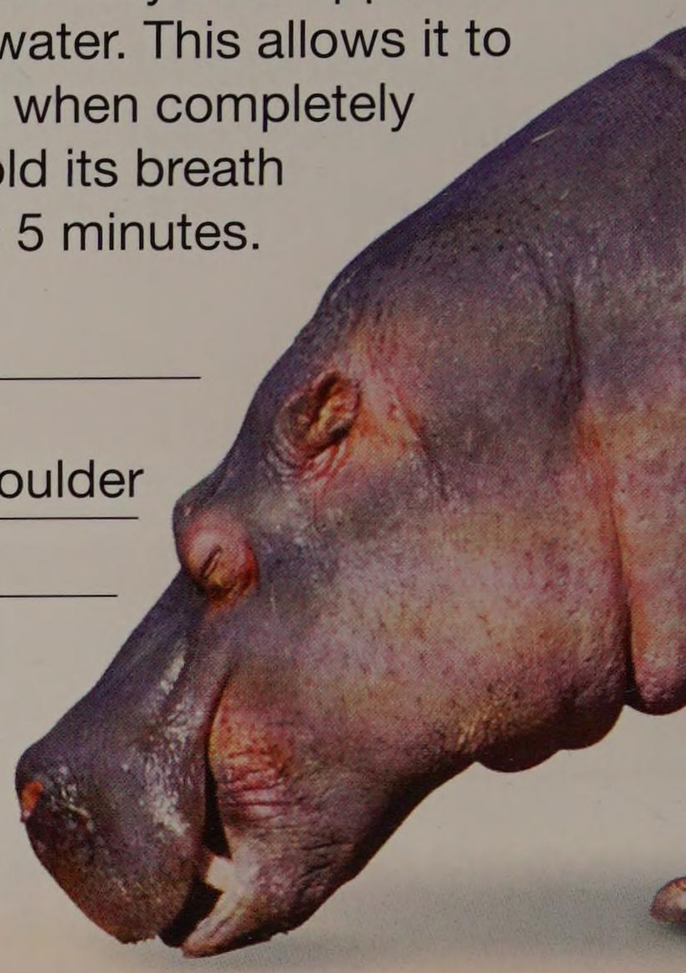
DIET Variety of plants

HABITAT Deciduous forests

DISTRIBUTION South Asia; introduced to Australia and North America

Hippopotamus
Hippopotamus amphibius

This is the larger of the only two species of hippo living today. The body of a hippo is slightly heavier than water. This allows it to walk on the river bed when completely submerged. It can hold its breath under water for up to 5 minutes.



SIZE 1.3–1.7 m (4.25–5.5 ft) tall at shoulder

DIET Mainly grass

HABITAT Wetlands and rivers

DISTRIBUTION Eastern, western, and southern Africa

Impala
Aepyceros melampus

Impalas are graceful and adaptable antelopes. When in danger, they emit loud warning snorts and race off in a zig-zag, interspersed with leaps to confuse predators.

SIZE 73–92 cm (29–36 in) tall at shoulder

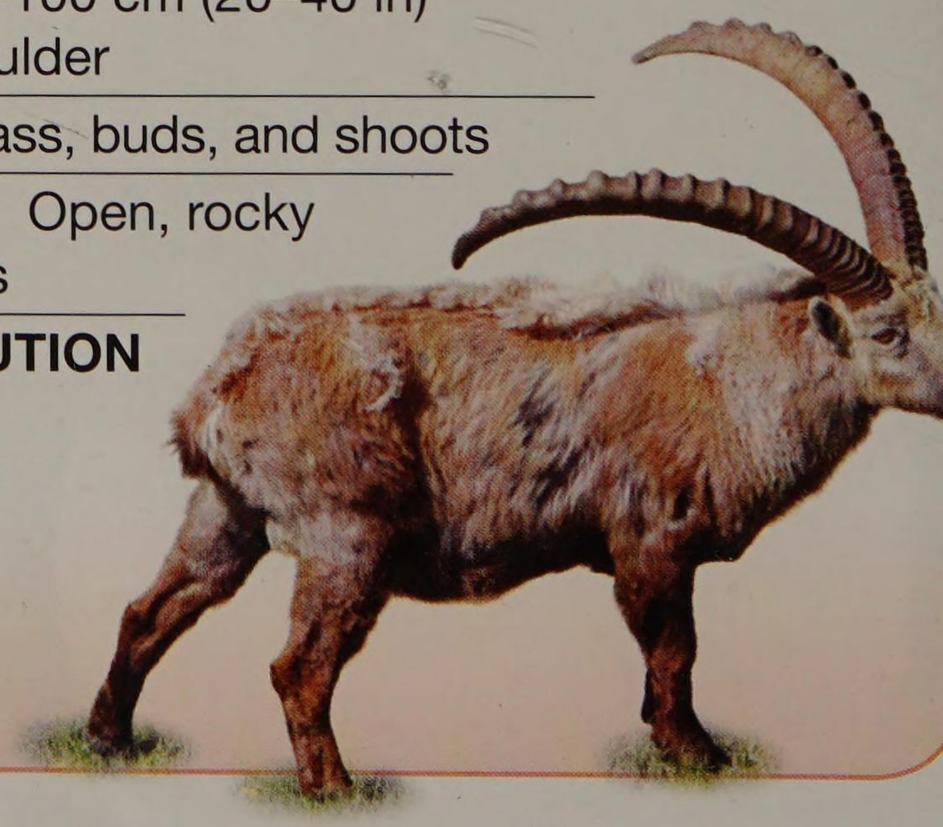
DIET Mainly grass

HABITAT Open habitats

DISTRIBUTION East and southern Africa

Alpine ibex
Capra ibex

The alpine ibex lives above the treeline in the Alps. It has thick, curved horns up to 1 m (3.3 ft) long. Males compete for the attention of the females by fighting.



SIZE 50–100 cm (20–40 in) tall at shoulder

DIET Grass, buds, and shoots

HABITAT Open, rocky mountains

DISTRIBUTION The Alps of Europe

Giraffe

Giraffa camelopardalis

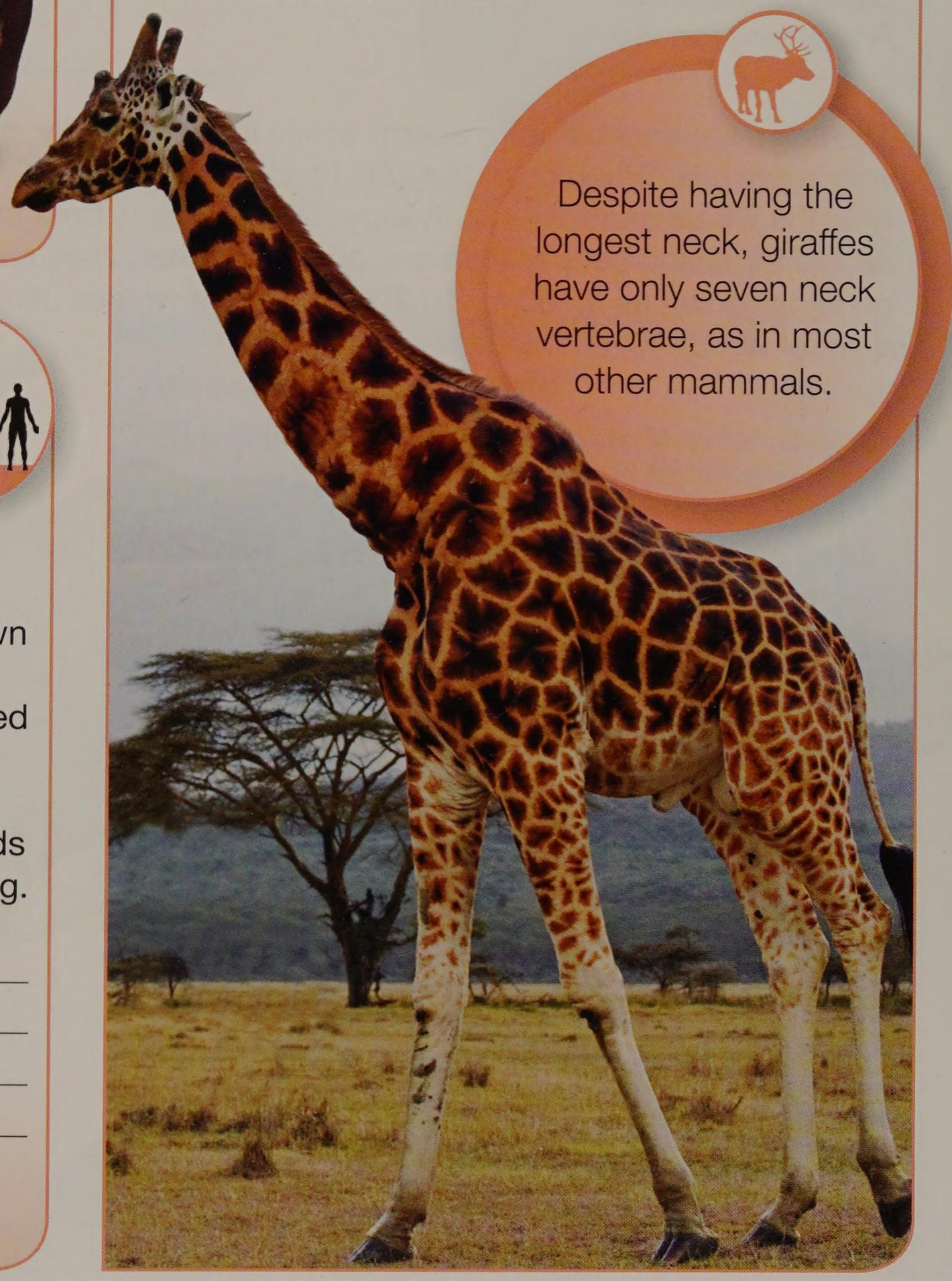
An elongated neck, tongue, and shoulders allow the giraffe to browse higher than any other mammal. Giraffes have large eyes and ears, stiltlike legs, heavy feet, and a thin tail with a long black tuft that helps to whisk flies away.

SIZE 4.5–5.5 m (14.75–18 ft)

DIET Mainly acacia leaves and wild apricot

HABITAT Dry savanna and open woodlands

DISTRIBUTION Africa

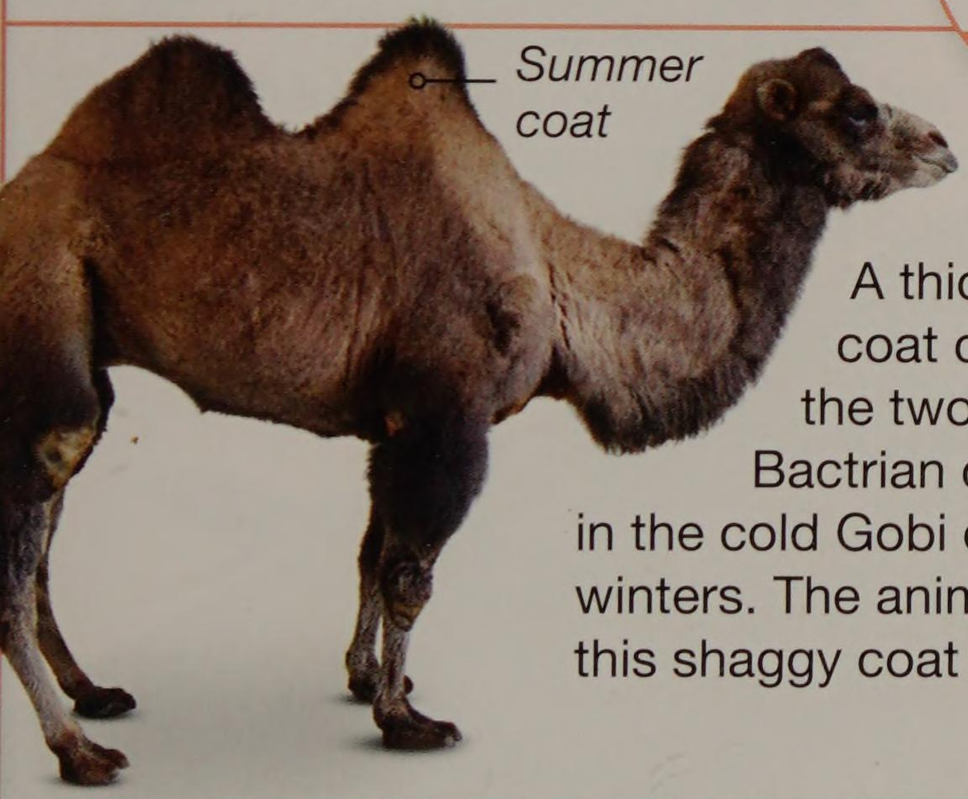


Despite having the longest neck, giraffes have only seven neck vertebrae, as in most other mammals.

Bactrian camel

ENDANGERED

Camelus bactrianus



A thick, brown coat covers the two-humped Bactrian camel in the cold Gobi desert winters. The animal sheds this shaggy coat in spring.

SIZE 1.8–2.3 m (6–7.5 ft) tall at shoulder

DIET Grass, leaves, and shrubs

HABITAT Deserts, steppes, and rocky plains

DISTRIBUTION Gobi desert, central Asia

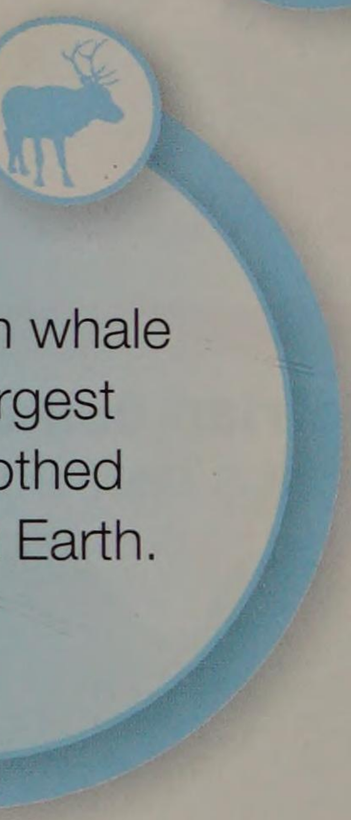
Cetaceans

Whales, dolphins, and porpoises make up an order of mammals called the cetaceans. They are divided into those that have teeth and those that have plates made of baleen instead. Like land mammals, cetaceans breathe using their lungs and suckle their young. They are found throughout the world's oceans.

Sperm whale

Physeter catodon

The huge square head of a sperm whale is filled mostly with waxy oils. When cold, the wax hardens, which may help the whale control its buoyancy. These whales hold the record for diving deeper than any other mammal. They can go as far down as 3,100 m (10,200 ft). Sperm whales usually dive for about 40–50 minutes.



The sperm whale is the largest living toothed animal on Earth.

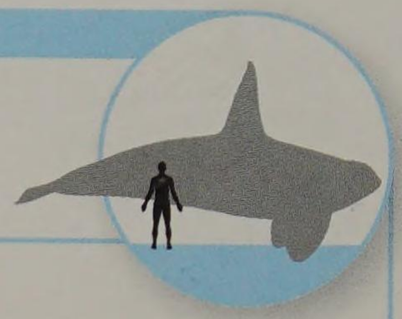
SIZE 11–20 m (36–66 ft) long

DIET Mainly squid and octopus

HABITAT Open oceans

DISTRIBUTION Throughout the world's oceans, except in Arctic waters

Killer whale
Orcinus orca



Killer whales, or orcas, are in fact huge dolphins. They are efficient predators that hunt in pods, chasing down and herding fish. They may even almost beach themselves on shores to catch seals or sea lions.

Dorsal fin in males is taller and less curved than in females

Large, paddle-shaped flippers

SIZE 5.5–10 m (18–33 ft) long

DIET Fish, seals, sharks, other cetaceans

HABITAT Coastal areas, seas, and oceans

DISTRIBUTION Throughout the world's oceans, except under polar ice

Humpback whale
Megaptera novaeangliae

These whales have long baleen plates that hang from their upper jaw and feed by filtering food from the water. Humpback whales sing to attract mates or find other whales.

SIZE 12–15 m (39–49 ft) long

DIET Mainly krill and fish

HABITAT Coastal areas, seas, and oceans

DISTRIBUTION Worldwide, except the Mediterranean Sea, Black Sea, Caspian Sea, Red Sea, and some Arctic waters

Amazon river dolphin
Inia geoffrensis

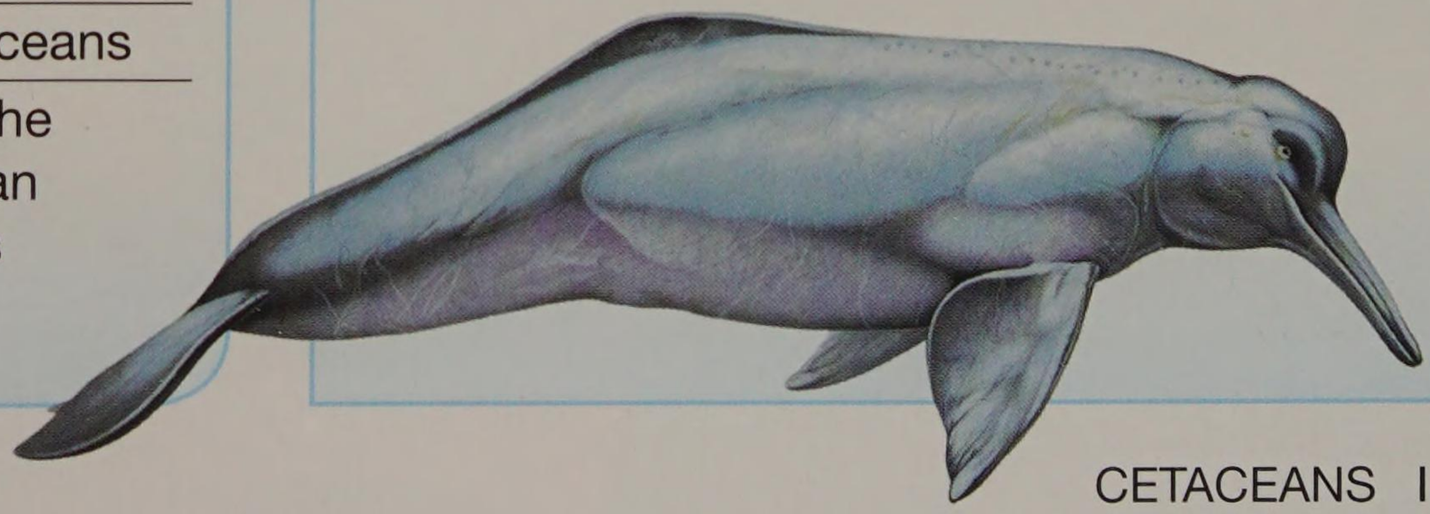
This freshwater dolphin is curious and may approach boats or swimmers. A long beak and a flexible neck help it to poke around on the river bed for prey. It has a hump on its back in place of a dorsal fin.

SIZE 1.8–2.5 m (6–8.25 ft) long

DIET Crabs, river turtles, and armoured catfish

HABITAT Rivers

DISTRIBUTION South America



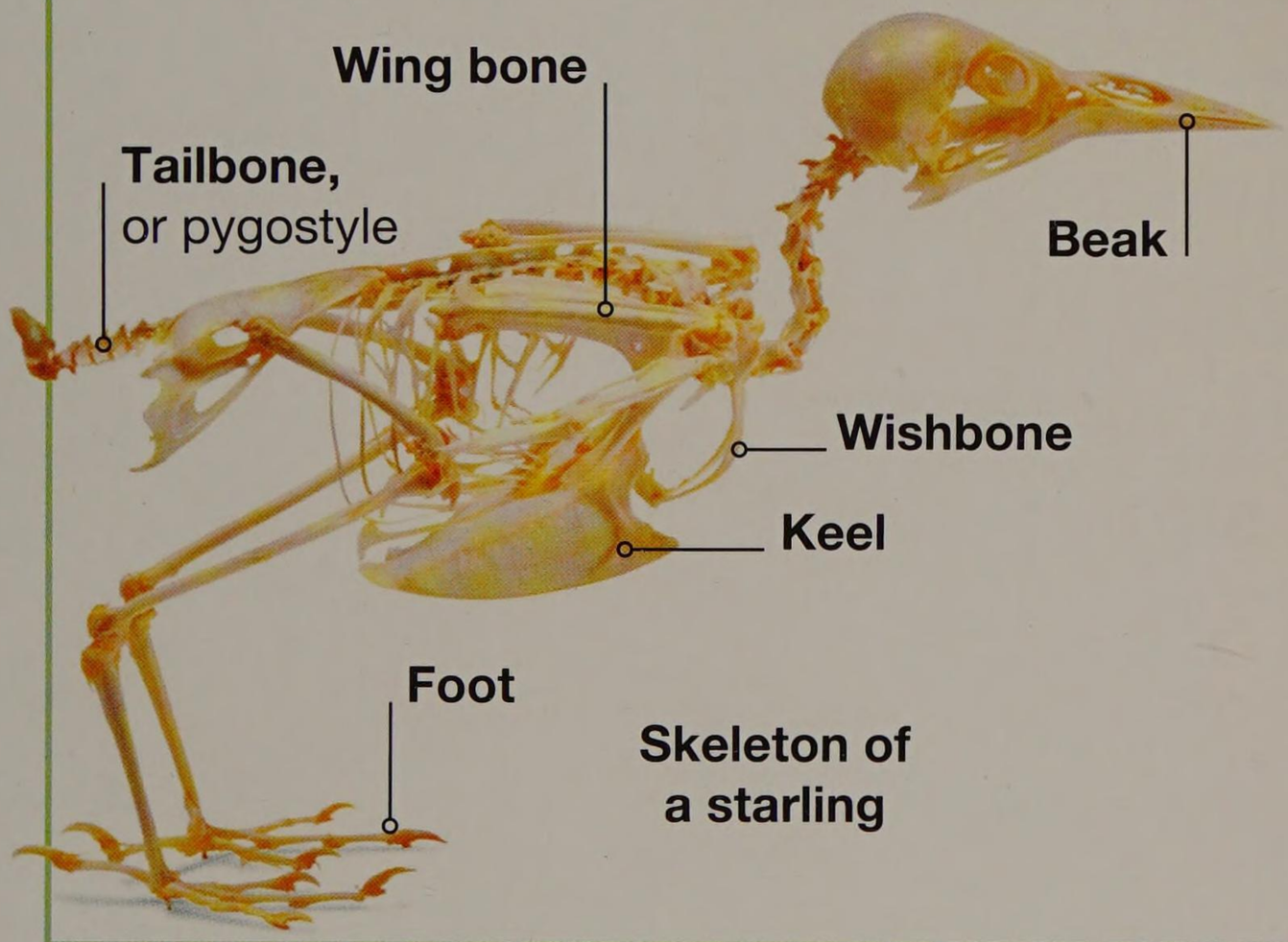
Birds

Birds are the most accomplished of all flying vertebrates. Most birds can fly, and this ability has helped them to spread across the world, even to remote islands and polar regions. Like mammals, birds are warm-blooded, but they reproduce by laying eggs. Birds use beaks – toothless jaws that are lightweight but strong – for feeding and preening.

NESTING
Most birds build nests to protect their eggs and young. Carmine bee-eaters dig burrows in vertical sandbanks along rivers.

Birds

Birds are warm-blooded, egg-laying vertebrates. Most birds can fly, thanks to their unique features, including lightweight, hollow bones, a light, toothless beak, and feathered wings.



Skeleton of a starling

Anatomy

Birds are adapted in ways that make them good at flying. Most of their bones are hollow, reducing body weight. The giant keel on the breastbone anchors their large, powerful flight muscles. These can form up to 40 per cent of the total body weight in some birds. The wishbone functions like a spring when the wings beat up and down.

Types of feather

Of all living animals, only birds have feathers, which are formed from the same material as mammal hair – keratin. As well as being used for flying, feathers also protect birds from heat and cold and keep them dry. Flying birds have four types of feather – down, contour, tail, and flight.

Down feathers are soft, and form a warm underlayer.

Contour feathers provide a smooth cover over the body.

Tail feathers help mainly in flight but many males use them in display.

Flight feathers provide the lift needed for flying.

Flight styles

Birds flutter, swoop, glide, or soar overhead depending on their wing shape. Owls have broad wings that they beat slowly. Woodpeckers flap their broad, tapering wings in bursts. Parrot wings are typically narrow and pointed, enabling them to fly at high speeds.

Tail feathers can be fanned out to act as a brake during landing

Nest woven from grass

Nests

Most birds build nests in which they lay eggs. Young ones that hatch from these eggs depend on their parents for food and protection.

Ratites

The world's largest birds are all members of a group called the ratites. All ratites are flightless. The larger species are far too heavy to fly and they, like the smaller kiwis, have a ground-based, running lifestyle.

FOCUS ON...
EGGS
Among living birds, the ratites lay the biggest eggs.

Ostrich
Struthio camelus

This ratite is the world's largest bird. It is unique among birds in having only two toes on each foot. Ostriches can run at speeds of up to 70 kph (45 mph) for as long as 30 minutes.

Black and white plumage in males

SIZE 2.1–2.8 m (7–9 ft) tall

DIET Mainly grass, seeds, and other plants

HABITAT Savanna and semi-deserts

DISTRIBUTION Western to eastern Africa (south of Sahara) and southern Africa

Southern cassowary
Casuarius casuarius

This ratite plays an important role in maintaining the diversity of rainforest trees by dispersing big fruit seeds over large areas. A horny casque (crest) on top of the bird's head and wattles (fleshy growths) on its neck are unique to this bird. Females are larger than males and have a brighter neck.

SIZE 1.3–1.7 m (4.25–5.5 ft) tall

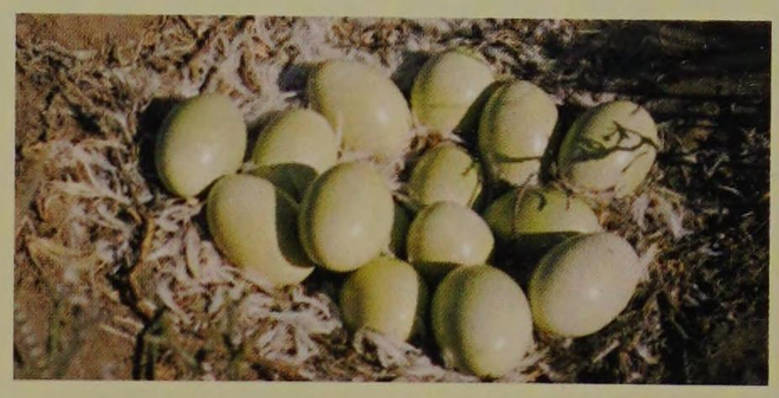
DIET Fruits

HABITAT Rainforests

DISTRIBUTION New Guinea and northeastern Australia

▲ Ostrich eggs are the largest in the world and can weigh more than 1.5 kg (3 lb).

▲ Kiwis lay eggs that are up to 25 per cent of the body weight of the female.



▲ Several female ratites often lay in the same nest, brooded by a single male. This nest is a rhea's.

Emu

Dromaius novaehollandiae

The emu is Australia's largest native bird. It has shaggy, drooping feathers, large legs, and tiny wings. It can travel large distances to look for food, sprinting and trotting on the way.

SIZE 1.5–1.9 m (5–6.25 ft) tall

DIET Seeds and berries

HABITAT Grasslands

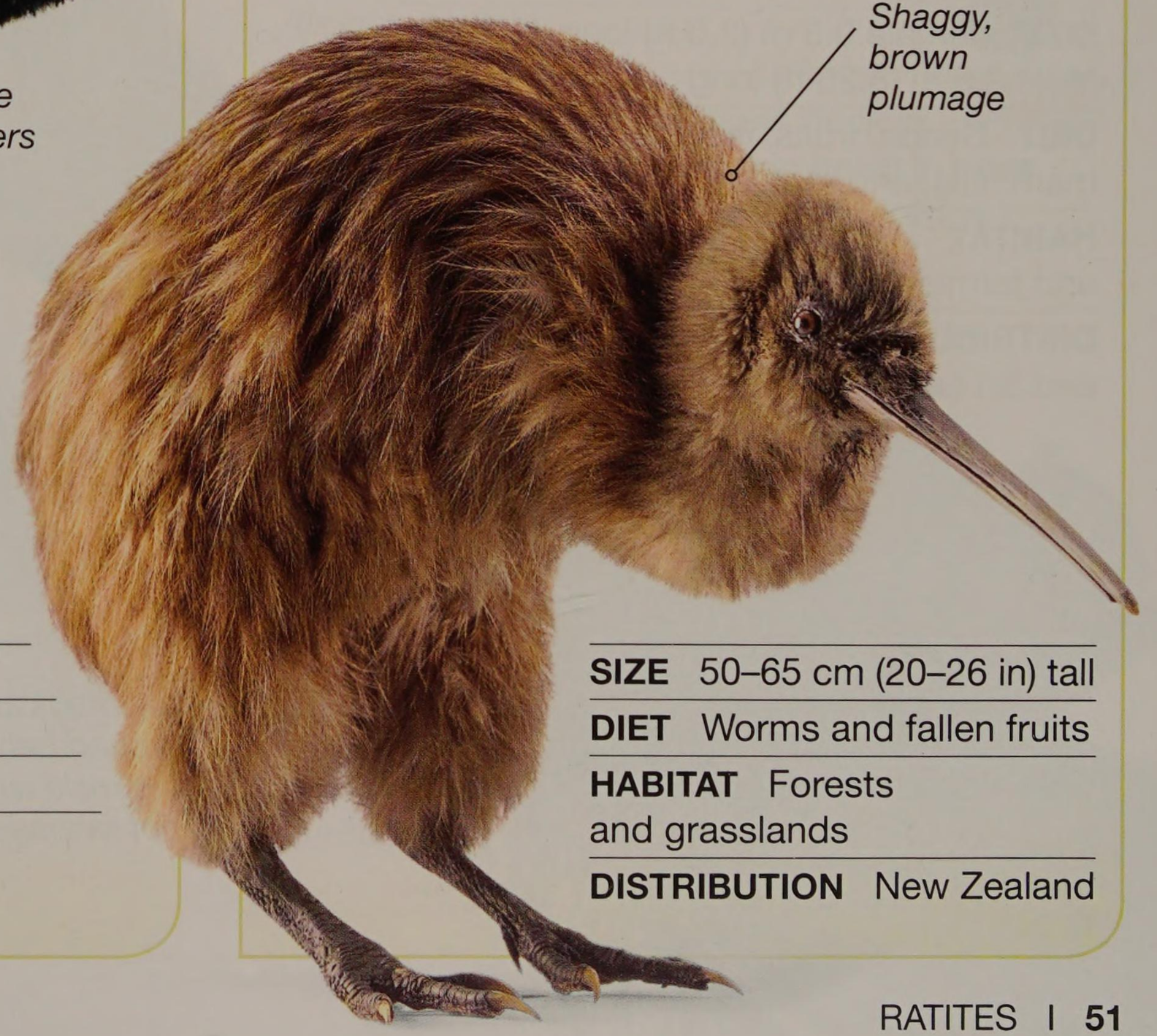
DISTRIBUTION Australia

North Island kiwi

Apteryx mantelli

ENDANGERED

This ratite has nostrils at the tip of its long bill. When looking for food, it walks slowly, tapping the ground with its bill and sniffing. It can even push its entire bill into the ground to find prey.



SIZE 50–65 cm (20–26 in) tall

DIET Worms and fallen fruits

HABITAT Forests and grasslands

DISTRIBUTION New Zealand

Gamebirds and waterfowl

Gamebirds are mainly ground-dwelling birds. They can take to air to escape but cannot fly for long. Waterfowl (ducks, geese, and swans) are strong swimmers with waterproof feathers and webbed feet. They are powerful fliers and many migrate great distances to breed.

Indian peafowl

Pavo cristatus

The Indian peafowl is a stunning gamebird. Known as the peacock, the male peafowl shows off a magnificent fan of feathers to impress his mate. These plumes emerge from just above his short tail, hidden beneath.

SIZE Female 0.8 m (2.5 ft) long, Male 2.5 m (8.25 ft) long

DIET Seeds, fruits, insects, small mammals, and reptiles

HABITAT Deciduous forests and farmlands

DISTRIBUTION India and Sri Lanka

Tail drags along ground behind the male when not fanned out

Peacocks have the longest feathers of all birds. They can be up to 2 m (6.5 ft) long.

Vulturine guineafowl
Acryllium vulturinum

This bird is the largest guineafowl and usually lives in large groups. It is named after its bare head and scrawny neck, which give it a vulturelike look.

SIZE 61–71 cm (24–28 in) long

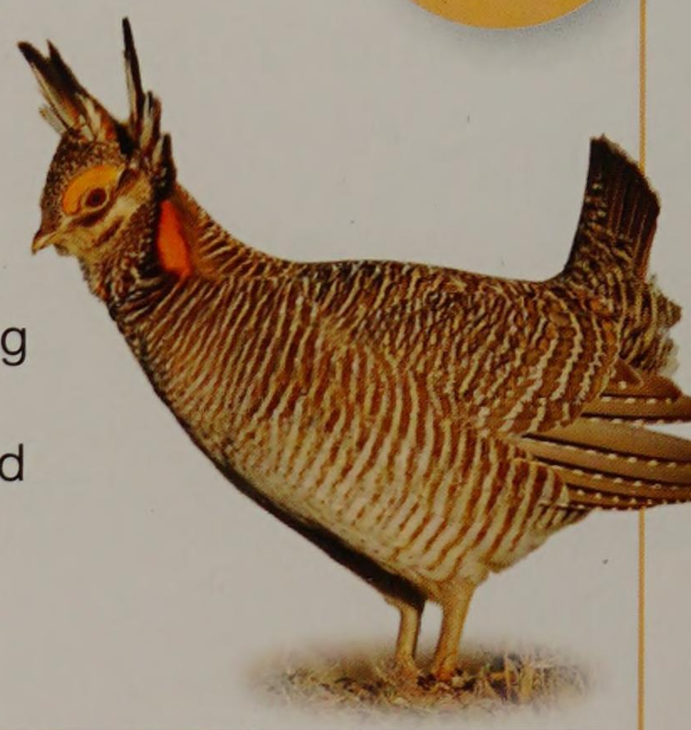
DIET Mainly plants

HABITAT Mainly savanna

DISTRIBUTION East Africa

Lesser prairie chicken
Tympanuchus pallidicinctus

A smaller version of the greater prairie chicken, this bird was once found in prairie grassland all over North America. Farming on native prairie land has, however, restricted its habitat.



SIZE 38–41 cm (15–16 in) long

DIET Seeds, insects, and acorns

HABITAT Prairie and mixed grasslands

DISTRIBUTION Southern North America

Black swan
Cygnus atratus

Black swans have the longest necks of all swans. They are highly social and often flock together on lakes, but only occasionally nest together.

SIZE 1.1–1.4 m (3.5–4.5 ft) long

DIET Water plants

HABITAT Large, shallow lakes

DISTRIBUTION Australia; introduced to New Zealand

Mandarin duck
Aix galericulata

Of all the ducks, the Mandarin duck is most likely to roost and nest in holes in trees. The breeding plumage of males (below) is among the most ornate of all birds.

SIZE 41–51 cm (16–20 in) long

DIET Plants, seeds, nuts, and insects

HABITAT Trees near lakes, pools, and rivers

DISTRIBUTION Northeastern Asia; introduced to western Europe

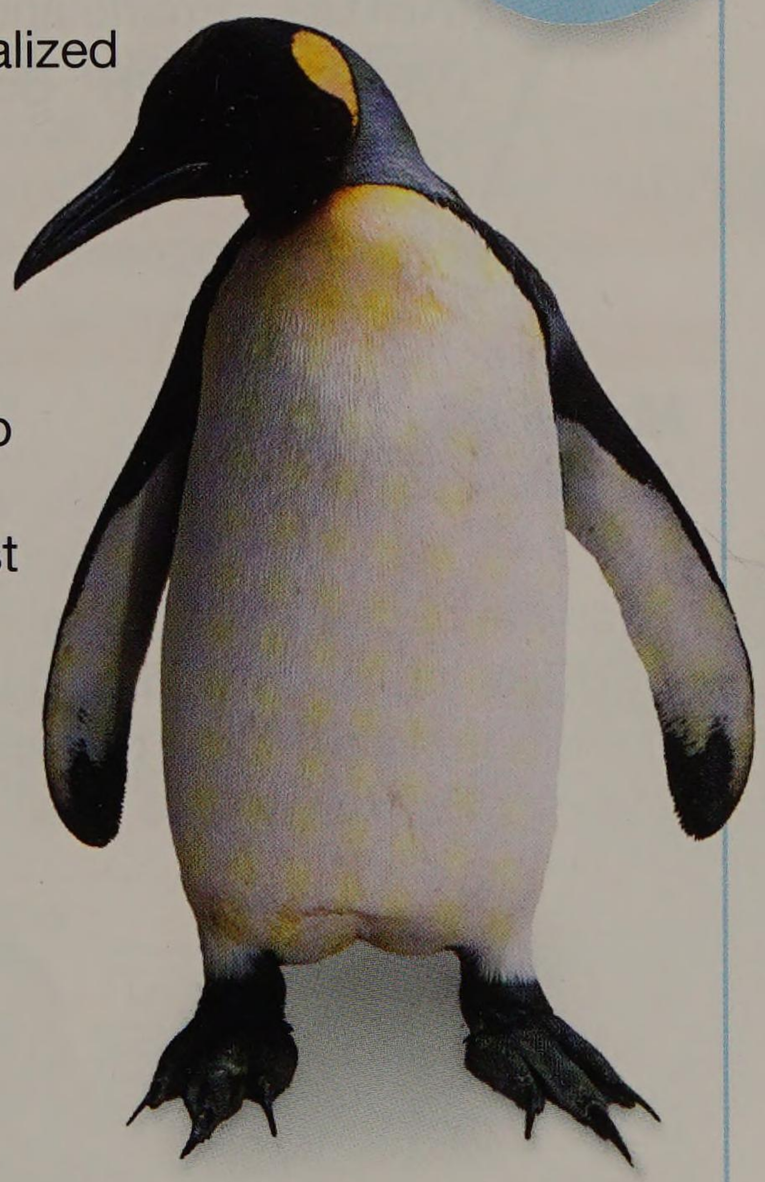
Penguins, albatrosses, and divers

Penguins and albatrosses are seabirds. The flightless penguins live in the cold climates of the southern hemisphere, while the long-winged albatrosses are found worldwide. The divers are mainly coastal, but frequent warmer climates in winter.

King penguin

Aptenodytes patagonicus

Penguins are specialized seabirds that "fly" under water by flapping their flipperlike wings. King penguins can dive to depths of up to 300 m (1,000 ft). Penguins can adjust their vision under water, which lets them catch their prey easily.



SIZE 94–100 cm (37–40 in) tall

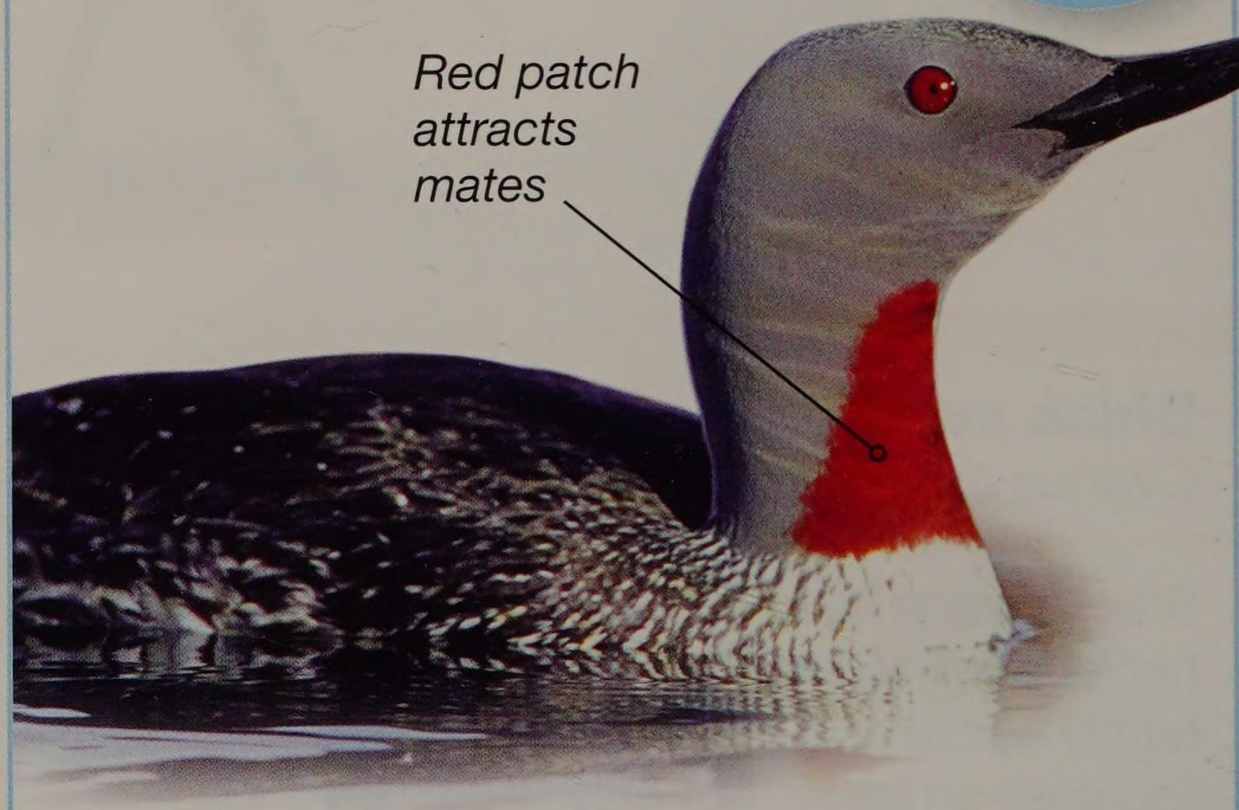
DIET Mostly lanternfish

HABITAT Nests on islands, on flat beaches with no snow or ice

DISTRIBUTION Southern Atlantic and southern Indian oceans

Red-throated diver

Gavia stellata



This diver is the smallest and lightest diver of all. When it is breeding in summer, it develops a striking throat patch that has inspired its name. The bird forms a life-long bond with its mate.

SIZE 53–69 cm (21–27 in) long

DIET Mainly fish and crustaceans

HABITAT Coastal bays and inlets, temperate forests, Arctic tundra, and freshwater areas

DISTRIBUTION Northern North America, northern Eurasia, Mediterranean Sea, Black Sea, and eastern Asia

Black-browed albatross

Thalassarche melanophrys

ENDANGERED

Albatrosses spend most of their lives at sea, only returning to land to breed. They spend weeks at sea, gliding low over the water while hunting for fish. Once found widely, their numbers have dropped because they are victims of fishing by humans. These birds tend to catch fish with hooks still attached, often leading to their death.

Long wing allows efficient long-distance flight

SIZE 80–95 cm (32–37.5 in) long

DIET Fish, squid, and crustaceans

HABITAT Open oceans and rocky areas on islands

DISTRIBUTION Southern oceans

Buller's shearwater

Puffinus bulleri

Buller's shearwaters breed only in New Zealand, on the Poor Knights Islands.

Shearwaters are the smaller cousins of the albatrosses. The Buller's shearwater breeds on few islands and because of this limited range, it may be at risk when breeding due to disease and introduced predators. If rats or cats reach these islands, they will wipe out the species by eating eggs and chicks.

SIZE 45–47 cm (18–18.5 in) long

DIET Krill, small fish, salps, and jellyfish

HABITAT Open oceans and islands

DISTRIBUTION Pacific Ocean

Flamingos and grebes

Flamingos are tall wading birds that use their bills to sieve tiny organisms from the water. They are known to gather in flocks of up to a million birds. Grebes are superb swimmers with small heads and thin necks that help them dive easily. Both flamingos and grebes are known for their amazing courtship rituals.

Western grebe

Aechmophorus occidentalis

The western grebe is the largest grebe in North America. In a dramatic courtship display, a pair rushes across the water side by side, with their long necks extended. The crown of this grebe stays black all year round.

SIZE 55–75 cm (21.5–29.5 in) long

DIET Carp, herring, insects, and crabs

HABITAT Marshes, lakes, and bays

DISTRIBUTION Canada to Mexico

Great crested grebe

Podiceps cristatus

Great crested grebes offer one another gifts of weed in an elaborate mating dance. They are also attentive parents. Parents take turns carrying the chicks on their backs and bringing them food.

SIZE 46–51 cm (18–20 in) long

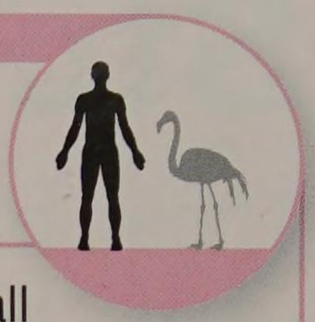
DIET Fish

HABITAT Large, open freshwater lakes

DISTRIBUTION Europe, Asia, Africa, Australia, and New Zealand

Caribbean flamingo

Phoenicopterus ruber ruber



The Caribbean flamingo has the brightest feathers of all flamingos. Chicks have grey plumage. Pairs of flamingos build nests of mud. A flamingo's territory is determined simply by how far its neck stretches from its nest.

SIZE 1.2–1.4 m (4–4.5 ft) tall

DIET Mainly brine shrimp

HABITAT Lagoons, mudflats, and lakes

DISTRIBUTION Northern coasts of South America and Mexico, Bahamas, Cuba, Dominican Republic, Haiti, Turks and Caicos Islands, and Galápagos Islands

Flamingos eat tiny shrimp that dye their feathers pink.

Storks and herons

These birds use their long legs to wade slowly in shallow water where they find most of their food. Long legs help keep their feathers dry. They use keen eyesight to spot prey in the water. All of them have long bills that grab prey easily.

Roseate spoonbill

Ajaia ajaja

Spoonbills feed by swinging their flat, touch-sensitive bill back and forth in the water. The bare patch of skin on the roseate spoonbill's head and face turns yellow in the breeding season.

SIZE 71–86 cm (28–34 in) tall

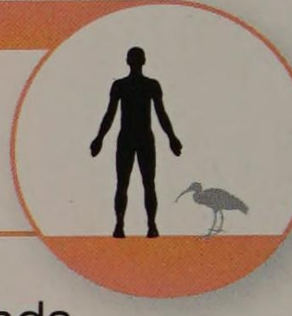
DIET Insects and small fish

HABITAT Shallow coastal waters

DISTRIBUTION South America

Scarlet ibis

Eudocimus ruber



The scarlet ibis builds its nest on islands, where its eggs and young are safe from predators. Nests are usually built in trees, far above the water the birds hunt in.

SIZE 56–61 cm (22–24 in) long

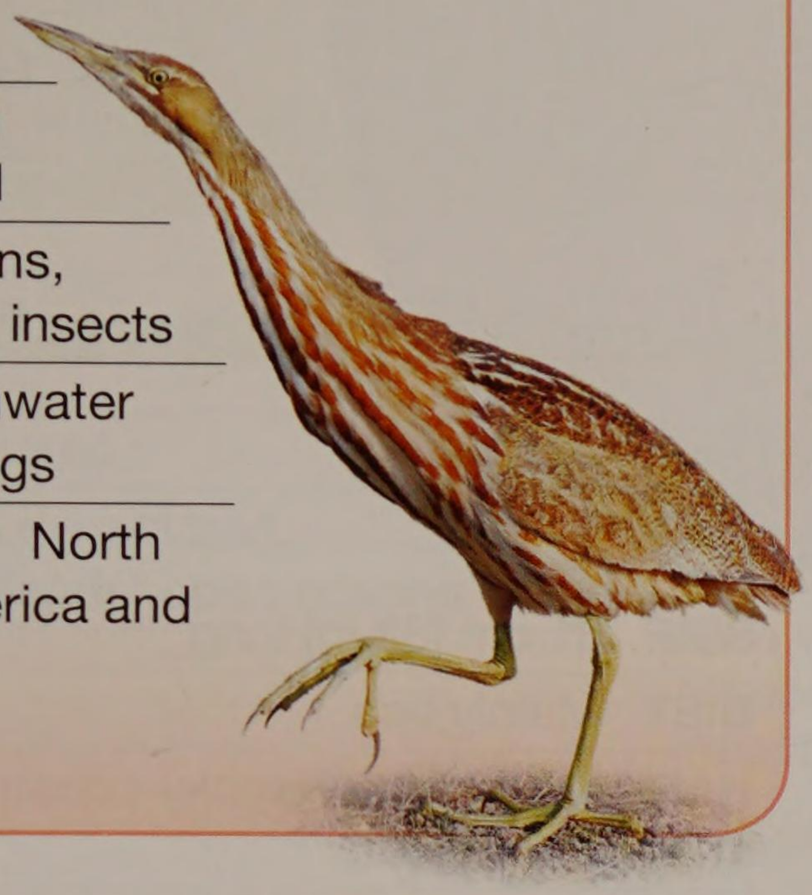
DIET Crustaceans, amphibians, and fish

HABITAT Wetlands, such as estuaries

DISTRIBUTION Tropical America

American bittern
Botaurus lentiginosus

Striped plumage makes this heron difficult to spot in its reed home. When alarmed, it raises its head and freezes, making it even more difficult to find. Its booming mating call, however, gives the bird away.



SIZE 60–75 cm (23.5–29.5 in) tall

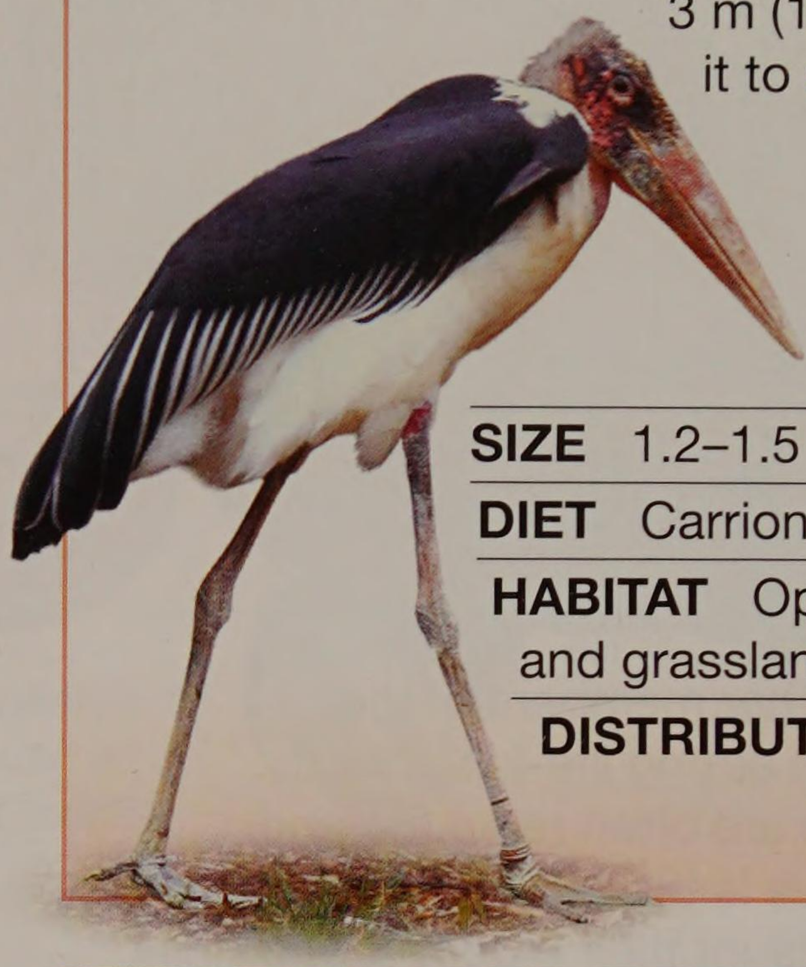
DIET Amphibians, fish, snakes, and insects

HABITAT Freshwater wetlands and bogs

DISTRIBUTION North and Central America and the Caribbean

Marabou stork
Leptoptilos crumeniferus

The marabou stork is an adept scavenger. The bare head and neck allow it to stick its head inside carcasses without soiling its feathers. It has a wide wingspan of 3 m (10 ft) that helps it to soar gracefully.



SIZE 1.2–1.5 m (4–5 ft) tall

DIET Carrion

HABITAT Open dry savanna and grasslands

DISTRIBUTION Africa

Jabiru stork
Jabiru mycteria

The jabiru is the tallest flying bird in South America. It has a characteristic slightly upturned bill. These birds build large nests that they return and add to each year. Nests may reach several metres in diameter.

SIZE 1.2–1.4 m (4–4.5 ft) tall

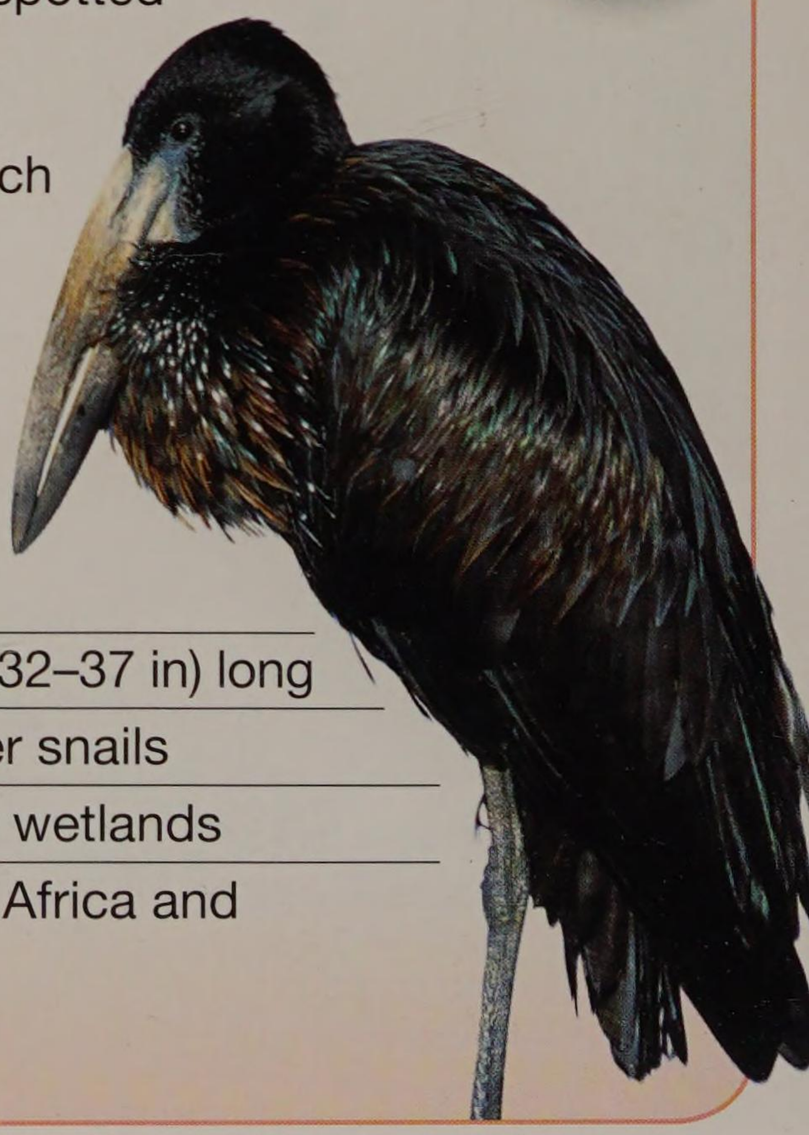
DIET Small water animals

HABITAT Freshwater wetlands

DISTRIBUTION South America

African openbill
Anastomus lamelligerus

This bird is often spotted looking for snails. Its curved bill has a distinct gap which holds the snails. It cracks open the shells and eats what is inside.



SIZE 81–94 cm (32–37 in) long

DIET Large water snails

HABITAT Mainly wetlands

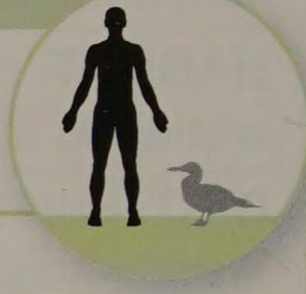
DISTRIBUTION Africa and Madagascar

Pelicans and gannets

Most members of this varied group of waterbirds are ocean-going hunters of fish. They are strong swimmers and the only group of birds with webbing between all four toes. Most pelicans fish from the surface, while gannets dive from great heights to catch shoaling fish.

Blue-footed booby

Sula nebouxii



These birds, like other members of the gannet family, form strong life-long bonds. Courtship displays are often repeated and the most impressive is the "sky-pointing ritual" – the birds flaunt their blue feet and point their beaks upwards.

SIZE 81 cm (32 in) long

DIET Mainly fish

HABITAT Nests on rocky coasts and hunts in open oceans

DISTRIBUTION California to Peru and the Galápagos Islands

Great frigatebird
Fregata minor

This member of the pelican family soars high up in the sky and rarely touches the ground. It has tiny legs and feet and can barely walk on land. A fierce competitor, it often attacks other birds forcing them to give up food.

SIZE 85–105 cm (33.5–41 in) long

DIET Fish and squid

HABITAT Nests on isolated, well-vegetated islands; open oceans

DISTRIBUTION South Atlantic

Male inflates his pouch to attract mates

Brown pelican
Pelecanus occidentalis

This is the only pelican that plunges, or dives, for food. It soars as high as 10 m (33 ft) before darting into the sea to catch fish. Unlike other pelicans, it lives in coastal waters and never flies far out to sea.

SIZE 1–1.4 m (3.3–4.5 ft) long

DIET Fish

HABITAT Coastal areas, such as sandy beaches

DISTRIBUTION North and South America

Hamerkop
Scopus umbretta

The hamerkop is a relative of pelicans but not a seabird. Very industrious birds, males and females together build huge nests, which have a hidden entrance at the side.

SIZE 56 cm (22 in) long

DIET Mainly amphibians

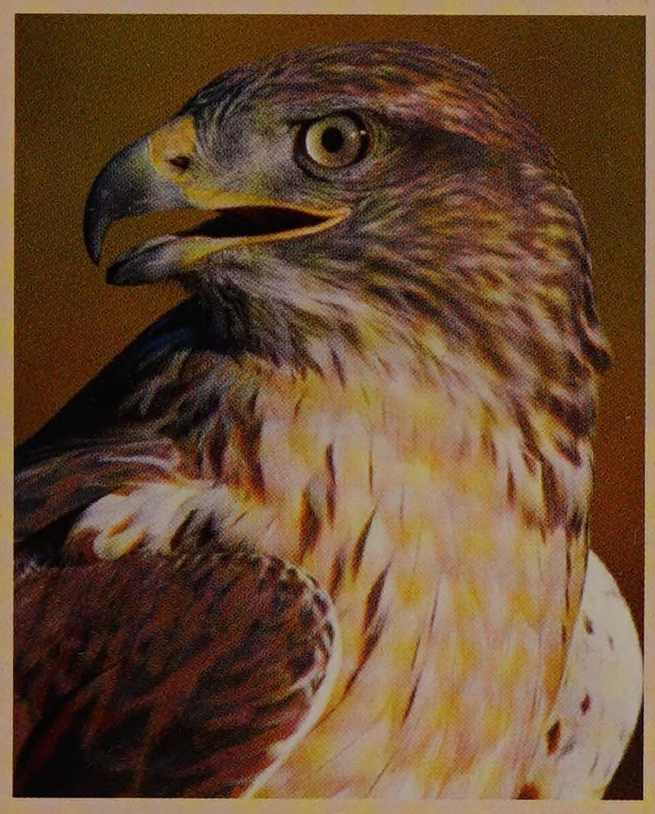
HABITAT Forests to semi-deserts with water

DISTRIBUTION Africa, Madagascar, and the Arabian Peninsula

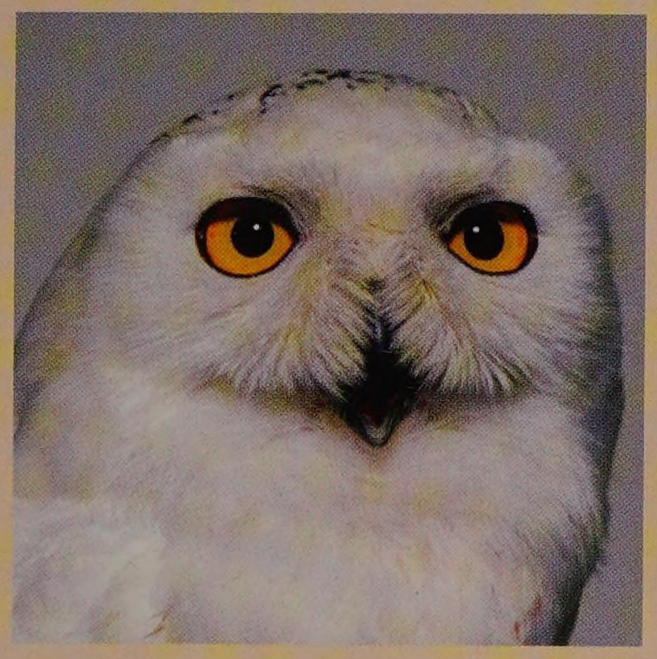
Raptors and owls

Raptors are birds of prey with sharp eyesight and muscular legs. Many are agile fliers. These day-flying hunters have sharp beaks and talons, which kill prey. Although not related to raptors, owls have similar features, but hunt mostly at night.

FOCUS ON...
CONTRASTS
Raptors and owls may seem similar but there are key differences.



▲ Most raptors' eyes are on the side of the head. They can spot prey from a long way off.



▲ Owls have large, forward-facing eyes that help them to judge distance to prey.

Great grey owl
Strix nebulosa

Amazingly, the great grey owl can hear movement at a depth of 60 cm (2 ft) under snow. It usually glides to a great height before swooping in and breaking through snow-covered ground to find prey. It can prey on birds as big as a grouse.

Disc-shaped face acts as an external ear, collecting sound and funneling it towards its ear openings

SIZE 65–70 cm (26–28 in) long

DIET Large rodents and birds

HABITAT Coniferous forests

DISTRIBUTION Northern North America and northern Eurasia

Andean condor
Vultur gryphus

This raptor has the largest wings of any bird. Its broad wings can span 3 m (10 ft) or more, and it uses them to catch rising warm air currents. It can soar in the air for hours, looking for remains of dead animals.

SIZE 1–1.4 m (3.3–4.5 ft) long

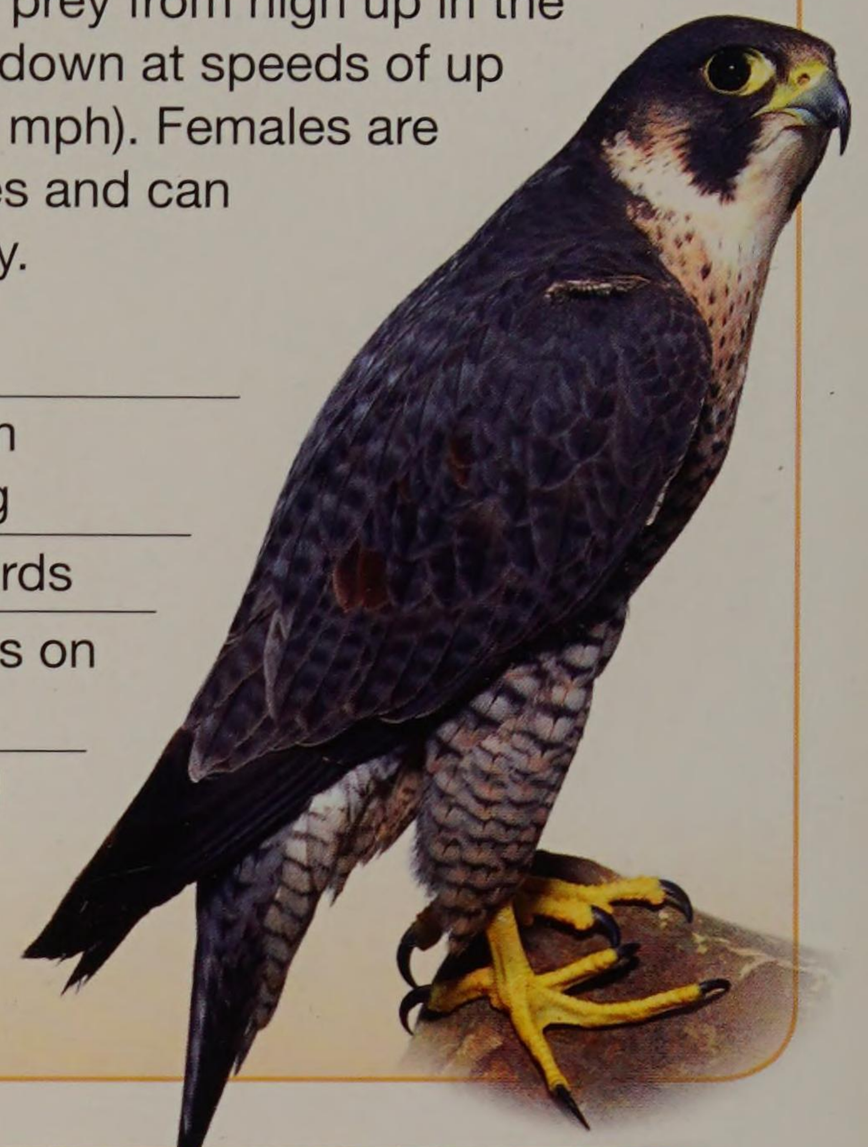
DIET Mainly carrion

HABITAT Mountains

DISTRIBUTION South America

Peregrine falcon
Falco peregrinus

This falcon is the world's fastest bird. Peregrines spot prey from high up in the sky and swoop down at speeds of up to 325 kph (200 mph). Females are larger than males and can catch larger prey.



SIZE 34–58 cm (13.5–23 in) long

DIET Mainly birds

HABITAT Nests on rock ledges

DISTRIBUTION Worldwide, except Antarctica

Bald eagle
Haliaeetus leucocephalus

The bald eagle is the national bird of the USA. This raptor uses its clawed feet to snatch fish from near the water surface. It may steal food from other raptors, such as ospreys. In the winter, bald eagles gather in large groups near salmon breeding sites. These birds pair for life.

SIZE 71–96 cm (28–38 in) long

DIET Mainly fish

HABITAT Near rivers, lakes, and on coasts

DISTRIBUTION North America

SNOWY OWL

Snowy owls have thick white plumage, which helps them to hide from their prey and pounce on them with ease. They can roost undisturbed all day long in polar regions, north of the Arctic Circle – which is where these owls commonly live.

Adult snowy owls commonly eat

five lemmings

a day, but must catch even more when rearing chicks

Auks, gulls, and waders

These birds are a common sight at sea or near shorelines. Gulls are seabirds that use their flying skills to catch prey. Waders usually feed by the water's edge. Auks generally dive under water for food. Many birds in this group nest on the ground.

Arctic tern

Sterna paradisaea

The Arctic tern is a seabird that undertakes the longest migration of any animal. It journeys from the Arctic to the Antarctic and back each year. In its lifetime, an average Arctic tern travels as far as a journey to the Moon and back.

SIZE 33–35 cm (13–14 in) long

DIET Fish and crustaceans

HABITAT Tundra, lakes, and coastal lagoons

DISTRIBUTION Polar regions

Great black-backed gull

Larus marinus

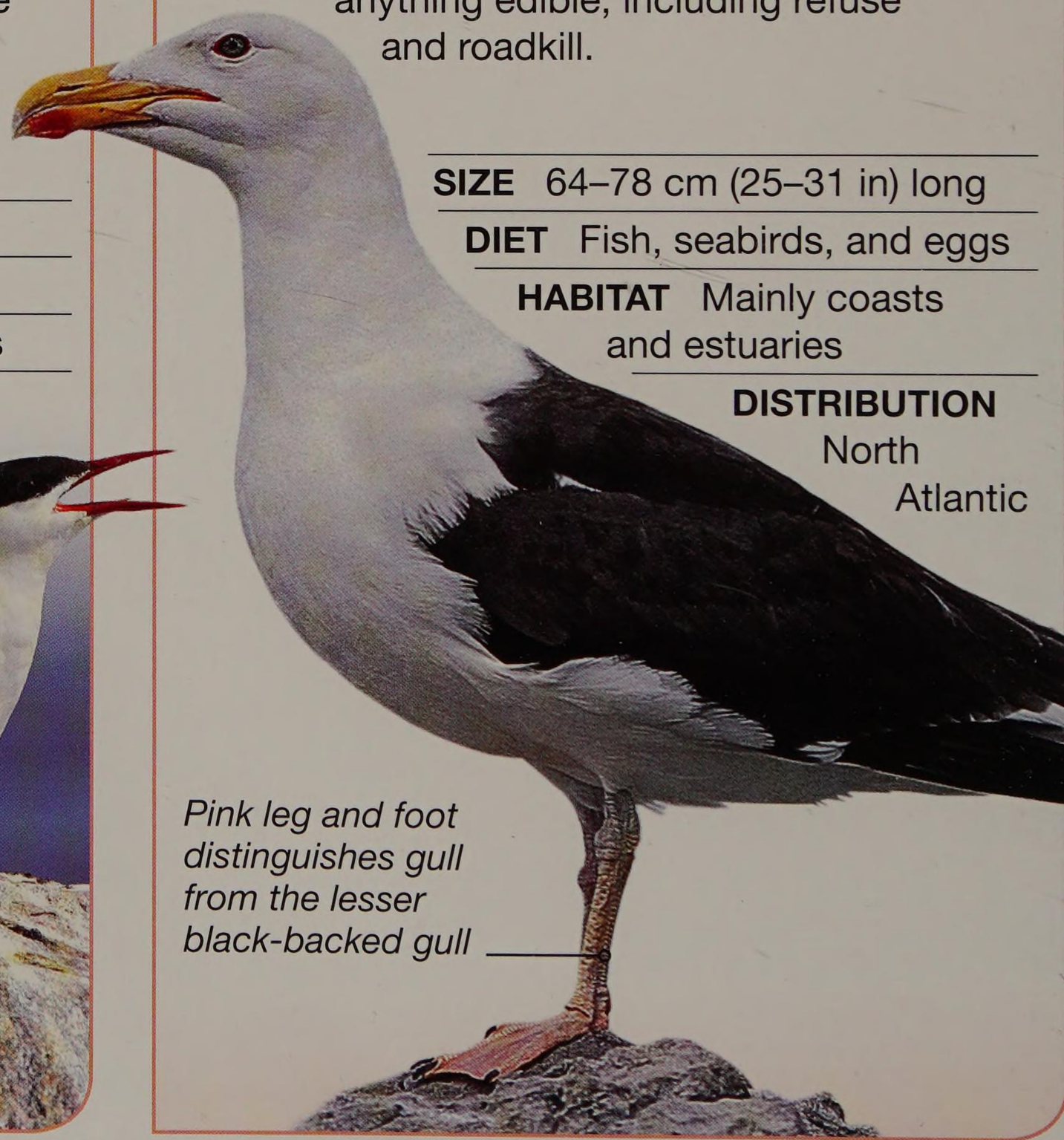
The world's largest gull, this is a heavy and powerful bird. It is a fierce predator and even pursues big seabirds. It scavenges almost anything edible, including refuse and roadkill.

SIZE 64–78 cm (25–31 in) long

DIET Fish, seabirds, and eggs

HABITAT Mainly coasts and estuaries

DISTRIBUTION North Atlantic



Pink leg and foot distinguishes gull from the lesser black-backed gull

Ruff
Philomachus pugnax

This is the most spectacular looking of all waders. Males develop colourful neck collars during the breeding season, which attract females.

SIZE 20–30 cm (8–12 in) long

DIET Aquatic insects

HABITAT Swamps and meadows

DISTRIBUTION Northern Eurasia and Africa

African jacana
Actophilornis africanus

The African jacana has extremely large feet that help this wader walk on floating plants. Males make attentive fathers and keep the chicks nestled close to keep them warm.

SIZE 23–31 cm (9–12 in) long

DIET Insects, small invertebrates, and aquatic plant seeds

HABITAT Wetlands

DISTRIBUTION West to central Africa

Atlantic puffin
Fratercula arctica

Puffins belong to the auk family. Atlantic puffins have special beaks. The upper part and tongue are ridged so that they can securely hold many fish at a time. This puffin can hold its breath under water for up to 30 seconds.

SIZE 26–29 cm (10–11.5 in)

DIET Small fish, such as sand eels, herring, squid, and small invertebrates

HABITAT Sea cliffs

DISTRIBUTION North Atlantic

Atlantic puffins have been known to hold as many as 62 fish in their beak.

Parrots

In the wild, these brightly coloured birds gather in noisy flocks. Ranging from small budgerigars to great macaws, parrots are popular as pets and have an amazing ability to learn and mimic human sounds.

FOCUS ON...

DIET

Most parrots feed on plants, fruits, and nuts. Some, however, have specialized diets.

Rosy-faced lovebird

Agapornis roseicollis

A small parrot found usually in dry areas, the rosy-faced lovebird often gathers at watering holes to bathe and also because it needs to drink frequently. These birds are called lovebirds because of the strong bond between a pair. Lovebirds mate for life and mutual grooming reinforces the bond between them.

SIZE 17–18 cm (6.5–7 in) long

DIET Leaves, seeds, and fruits

HABITAT Woodlands and scrubby hillsides

DISTRIBUTION Southwest Africa

Sulphur-crested cockatoo

Cacatua galerita

The bright yellow crest of the sulphur-crested cockatoos is raised when threatened or while mating. They live up to 40 years in the wild, and up to 70 years in captivity. Like many parrots, they eat clay to digest poison in some of their food.

SIZE 49 cm (19.5 in) long

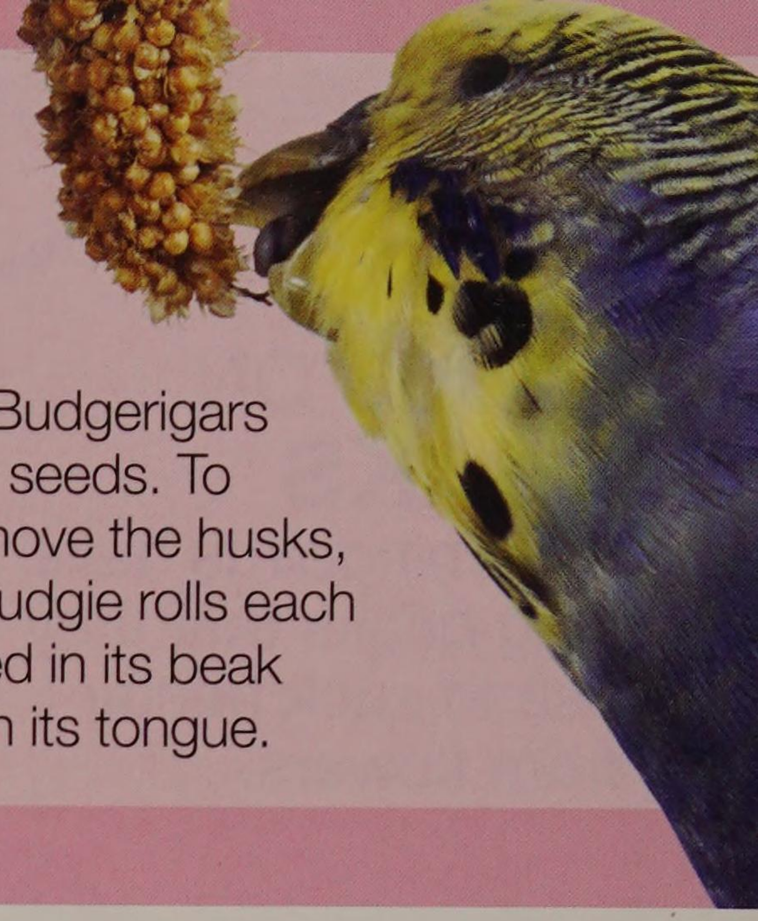
DIET Berries, seeds, nuts, and buds

HABITAT Forests, woodlands, and farmlands

DISTRIBUTION New Guinea and Australia

▲ Keas are flexible feeders. They feed on animal carcasses and leftover meat.

▲ The rainbow lorikeet collects nectar and pollen with the brushlike tip of its tongue.



▶ Budgerigars eat seeds. To remove the husks, a budgie rolls each seed in its beak with its tongue.

Blue-and-yellow macaw

Ara ararauna

With their colourful feathers, the blue-and-yellow macaws stand out in the rainforest canopy. They are dependent on palm trees for nesting but move around to look for food.

Beak is strong enough to crack brazil nuts or sever human fingers

SIZE 85 cm (33.5 in) long

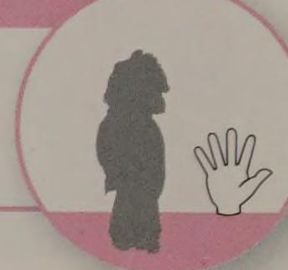
DIET Fruits, flowers, and nuts

HABITAT Mainly nests in palm trees

DISTRIBUTION Northern South America

Red fan parrot

Deroptyus accipitrinus



At rest, the red fan parrot's head pattern does not stand out. When alarmed, it raises its elongated neck and nape feathers, creating a rufflike effect. These fan across its head, adding to the raptorlike shape of the bird. This is the reason why this bird is also called the hawk-headed parrot.

SIZE 36 cm (14 in) long

DIET Seeds, nuts, fruits, and berries

HABITAT Tropical forests

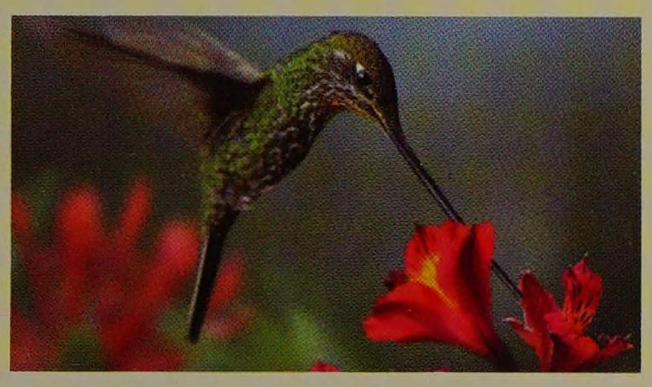
DISTRIBUTION South America

Hummingbirds and swifts

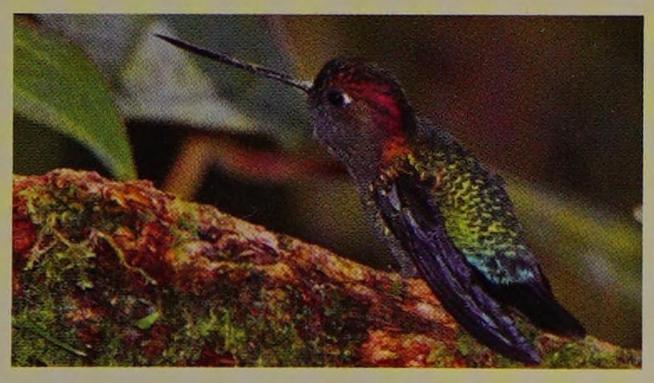
These birds have unique wings that make them skilled fliers. Swifts can stay aloft for years, landing only to breed. Hummingbirds can hover or even fly backwards.

FOCUS ON...
BEAKS
Hummingbirds have long beaks that they use to suck nectar from flowers.

▲ The down-curved beak of a white-tipped sicklebill helps it probe *Heliconia* flowers for nectar.



▲ The beak of the sword-billed hummingbird helps it feed from downward-pointing flowers.

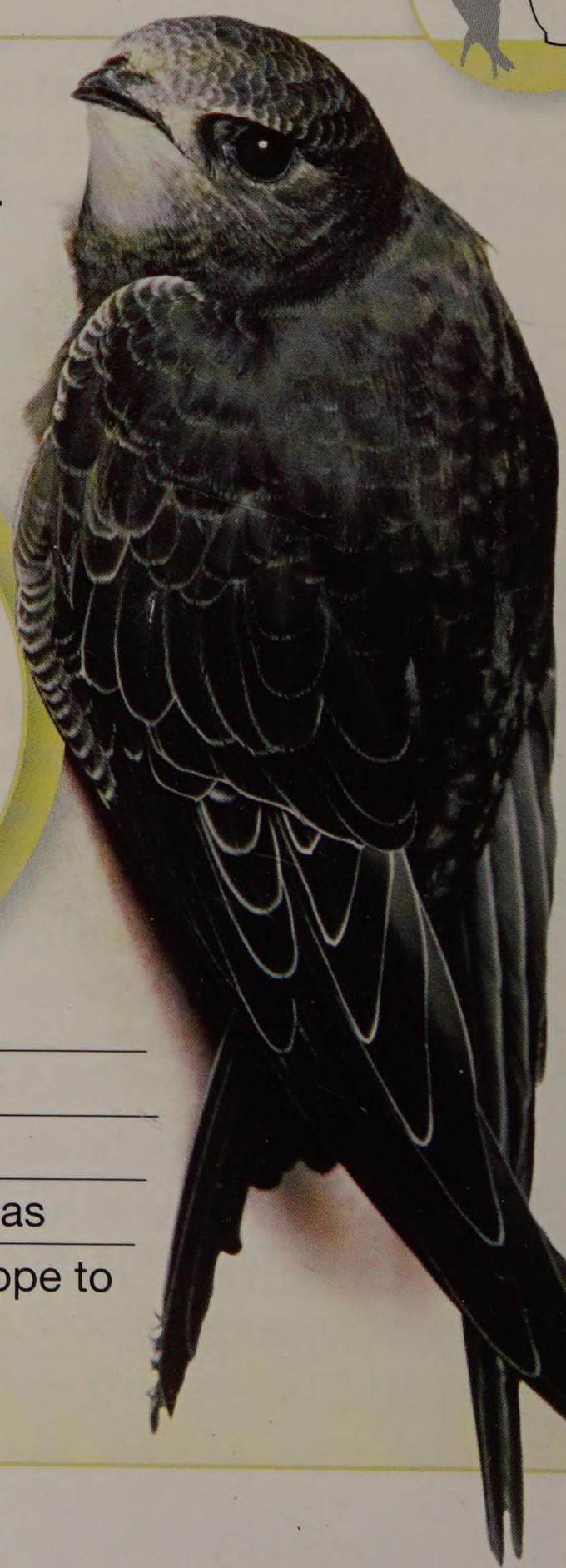


▲ The green-fronted lancebill feeds from plants using its long, almost up-curved beak.

Common swift
Apus apus

The common swift has narrow wings and a forked tail. Like other swifts, it is fast and agile. It catches insects in mid-air in its gaping bill.

One of the most aerial birds, the common swift feeds, mates, and even sleeps in flight.



SIZE 16–17 cm (6.5 in) long

DIET Insects

HABITAT Cliffs and urban areas

DISTRIBUTION Western Europe to central Asia

Ruby topaz

Chrysolampis mosquitus

The dazzling ruby topaz is a great traveller. Experts have not yet mapped out all of its migration routes, but one population is known to travel from northernmost to southernmost Brazil. It aggressively guards feeding territories containing its favourite flowers. During courtship, the male circles the female with his tail spread out like a fan.

SIZE 9 cm (3.5 in) long

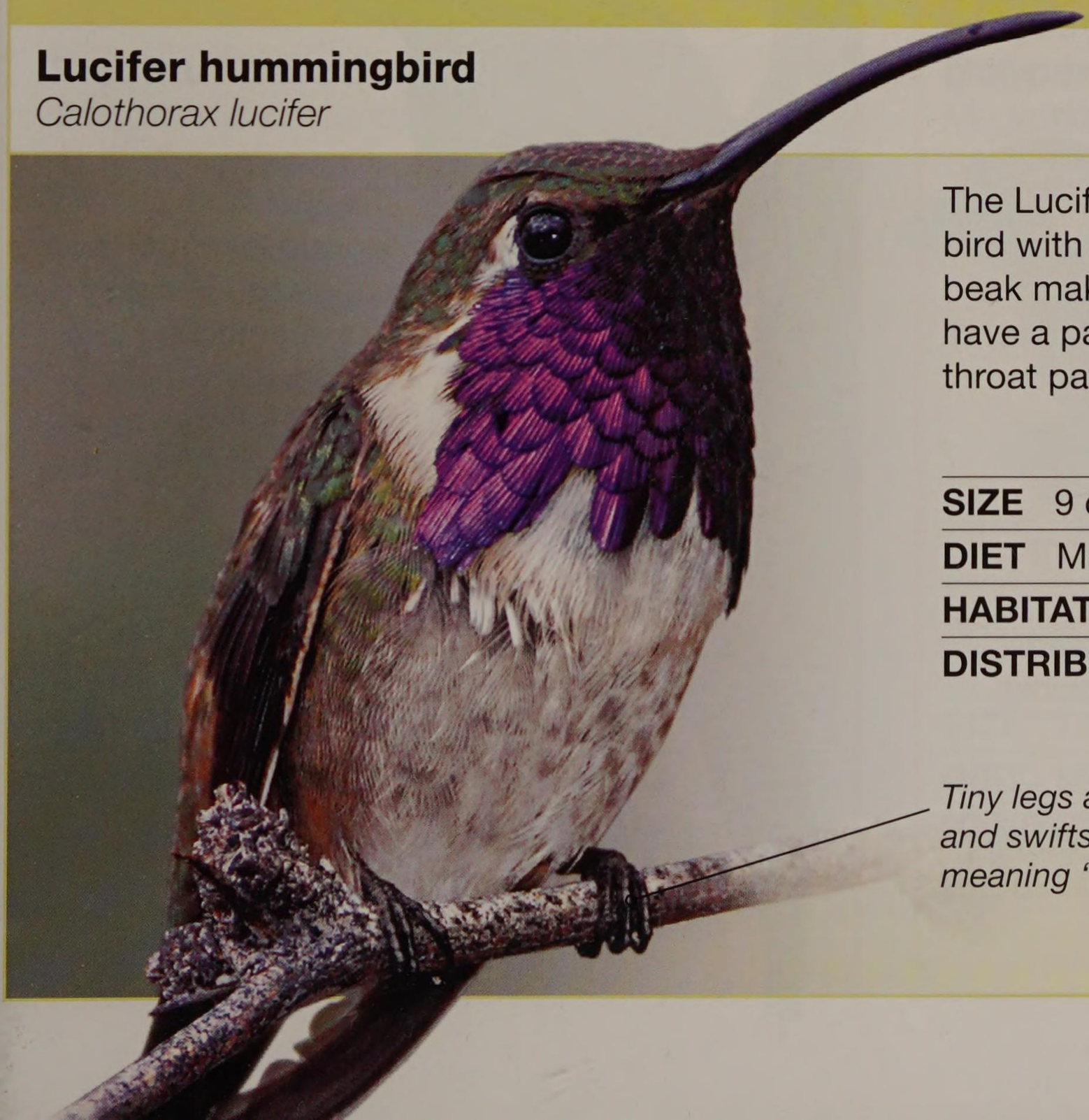
DIET Nectar and insects

HABITAT Forest edges and farmlands

DISTRIBUTION South America

Lucifer hummingbird

Calothorax lucifer



The Lucifer hummingbird is a tiny bird with a large head. Its long, down-curved beak makes it easy to identify. While females have a pale throat, males have a bright purple throat patch.

SIZE 9 cm (3.5 in) long

DIET Mainly nectar

HABITAT Semi-deserts

DISTRIBUTION Southern USA to Mexico

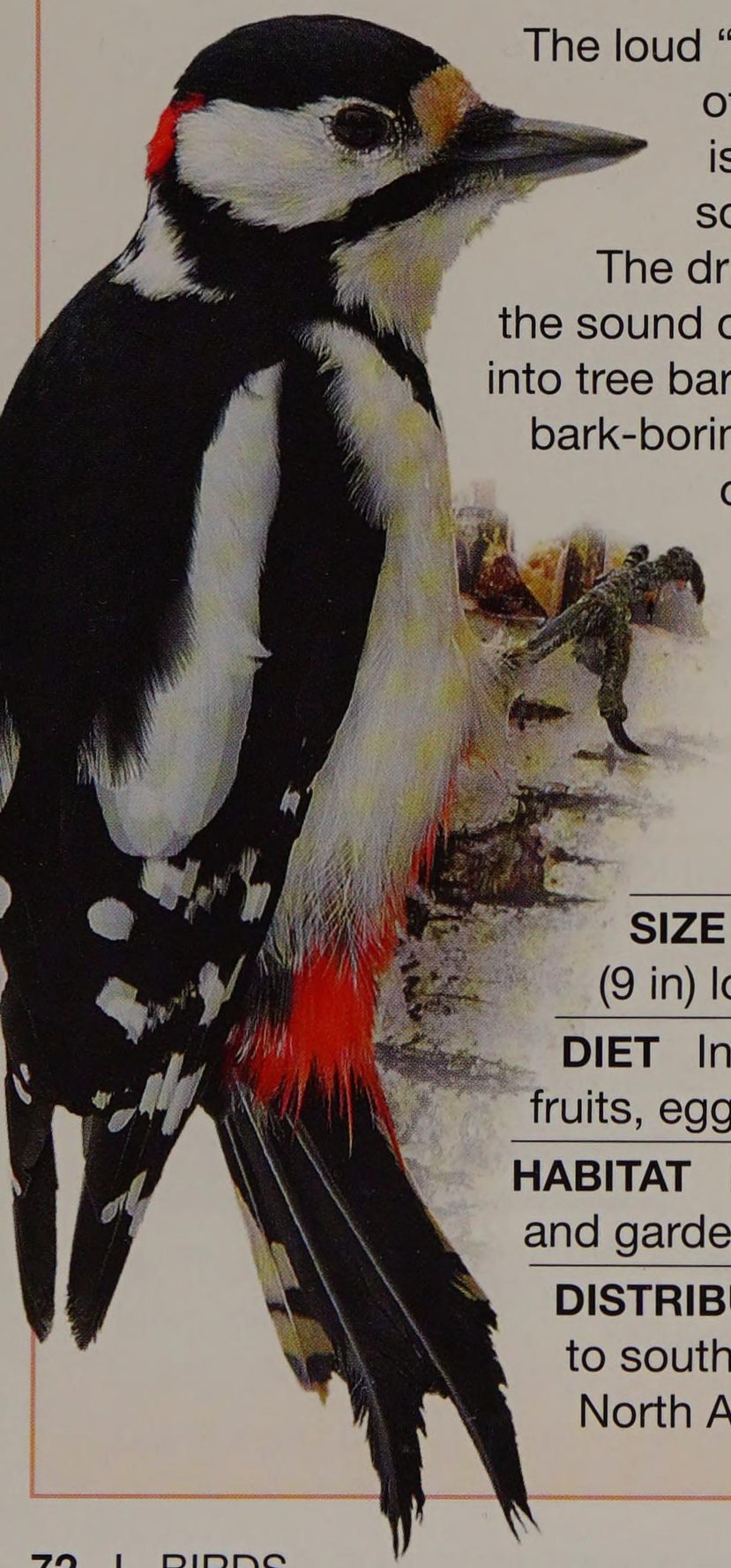
Tiny legs and feet give hummingbirds and swifts their group name Apodiformes, meaning "lacking feet"

Woodpeckers and relatives

All birds in this group have strong feet with two toes pointing forwards and two backwards, which helps them climb with ease. Woodpeckers use their chisel-like beaks to carve nest holes, toucans use their long beaks for reaching fruit, and barbets use their stout beaks for holding wriggling prey.

Greater spotted woodpecker

Dendrocopos major



The loud "drum-roll" of this bird is a common sound in spring. The drumming may be the sound of the bird drilling into tree bark to catch bark-boring beetle larvae, or chiselling out its nest. In spring, they use the sound to defend territories.

SIZE 22–23 cm (9 in) long

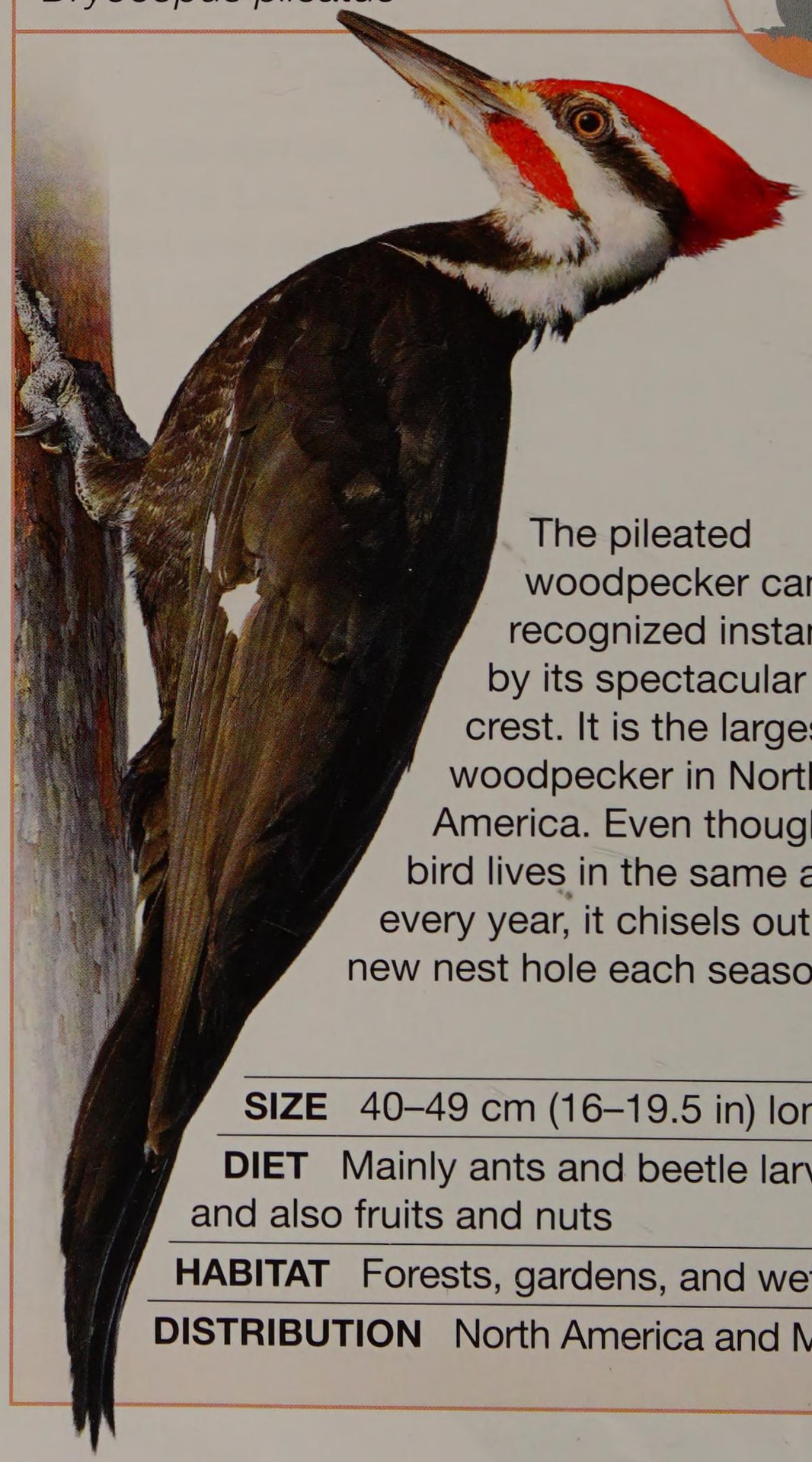
DIET Insects, seeds, fruits, eggs, and chicks

HABITAT Forests and gardens

DISTRIBUTION Europe to southeast Asia and North Africa

Pileated woodpecker

Dryocopus pileatus



The pileated woodpecker can be recognized instantly by its spectacular red crest. It is the largest woodpecker in North America. Even though this bird lives in the same area every year, it chisels out a new nest hole each season.

SIZE 40–49 cm (16–19.5 in) long

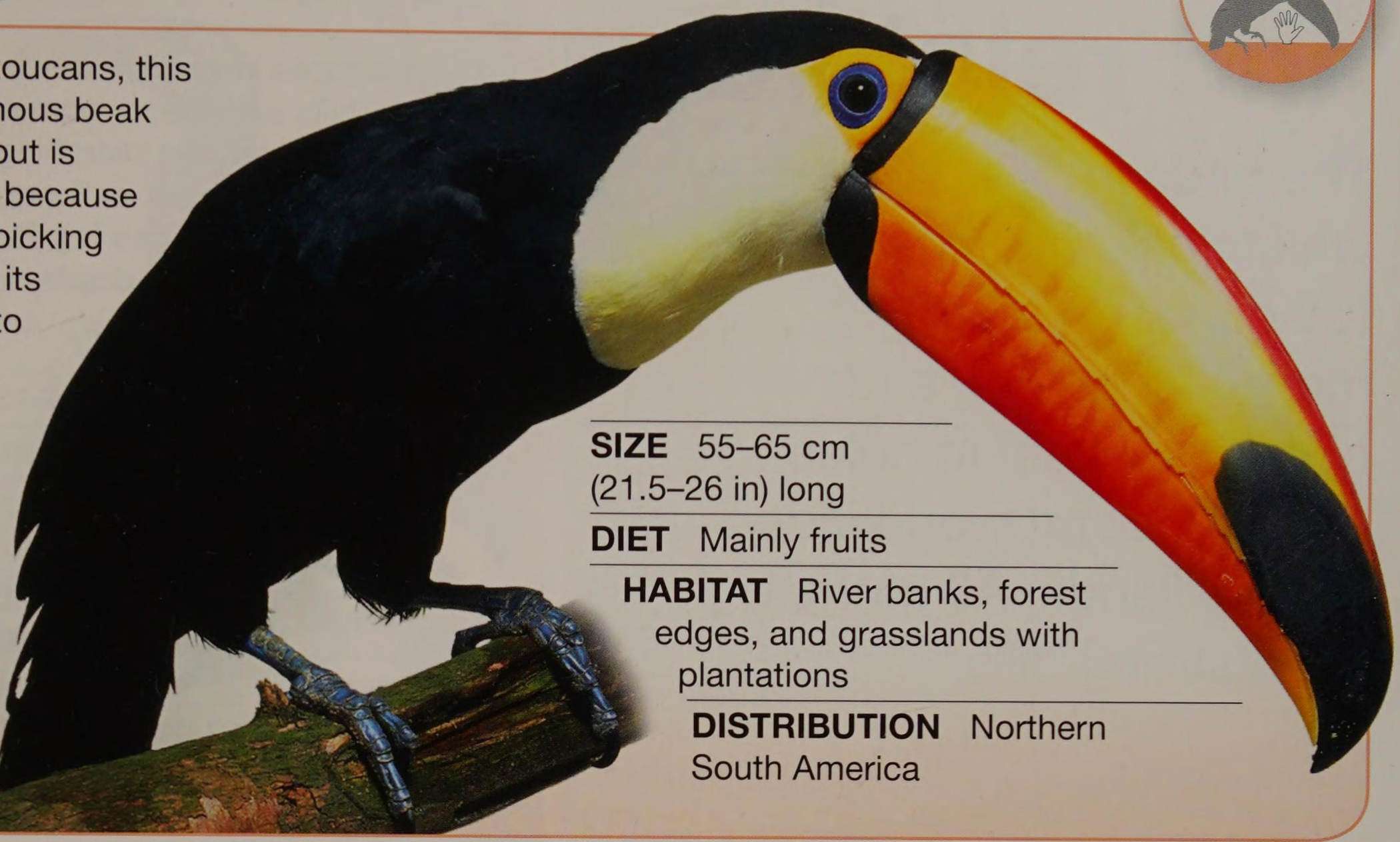
DIET Mainly ants and beetle larvae, and also fruits and nuts

HABITAT Forests, gardens, and wetlands

DISTRIBUTION North America and Mexico

Toco toucan
Ramphastos toco

The largest of all toucans, this bird has an enormous beak that looks heavy but is actually very light because it is hollow. After picking up food, it tosses its head backwards to move the food into its throat.



SIZE 55–65 cm (21.5–26 in) long

DIET Mainly fruits

HABITAT River banks, forest edges, and grasslands with plantations

DISTRIBUTION Northern South America

Chestnut-eared aracari
Pteroglossus castanotis

This bird is more lightly built than other toucans. Very acrobatic, it can feed on fruit even when hanging upside down.

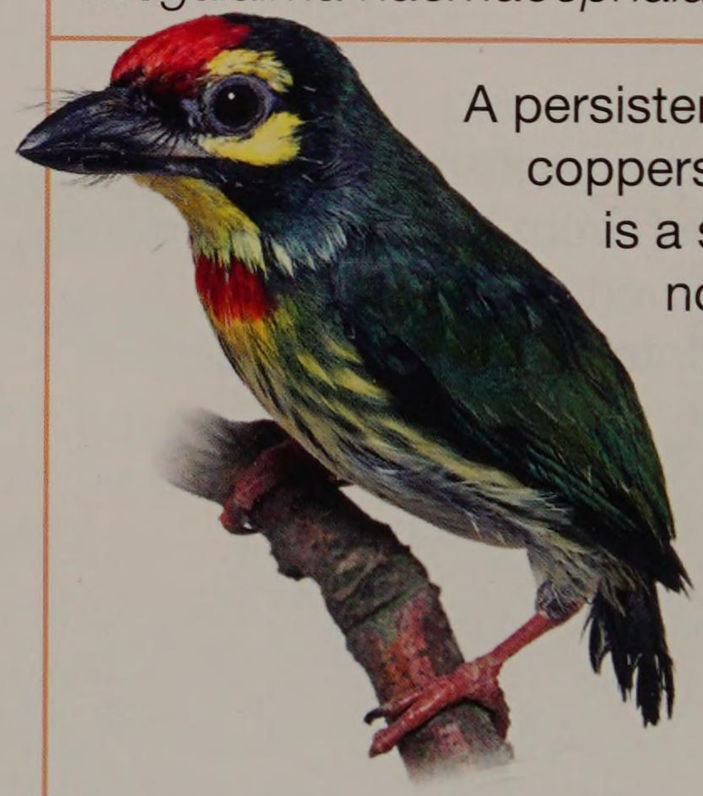
SIZE 37 cm (14.5 in) long

DIET Mainly fruits

HABITAT Forests, wetlands, and savanna

DISTRIBUTION Northwestern South America

Coppersmith barbet
Megalaima haemacephala



A persistent singer, the coppersmith barbet's song is a series of "tonk-tonk" notes. To attract a mate, this bird flicks its tail and puffs out its throat feathers.

SIZE 17 cm (6.5 in) long

DIET Mainly fruits

HABITAT Forest edges and scrublands

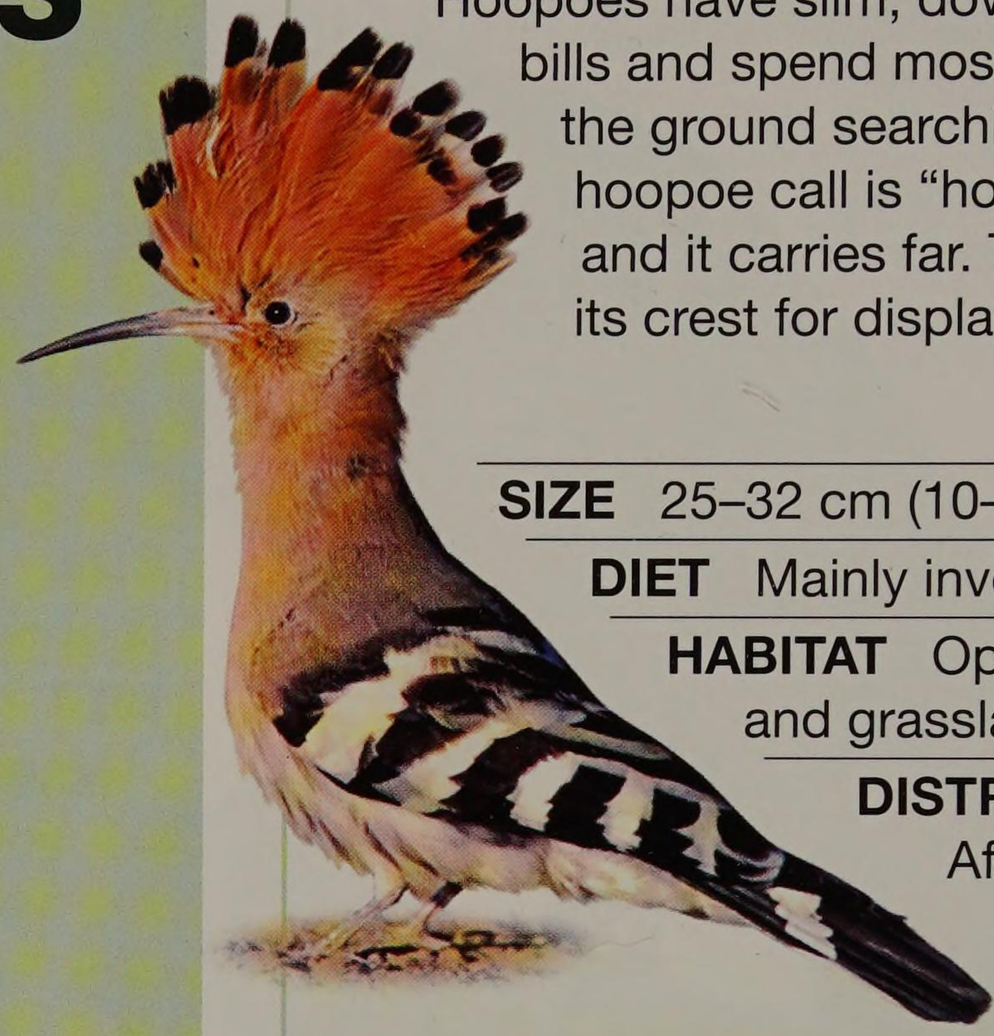
DISTRIBUTION Southern Asia

Kingfishers and relatives

The birds in this group – which includes kingfishers, todies, bee-eaters, motmots, rollers, and hornbills – nest in holes and are found worldwide in woodlands. All of them have strong bills.

Hoopoe
Upupa epops

Hoopoes have slim, down-curved bills and spend most of the day on the ground searching for food. The hoopoe call is "hoop-hoop-hoop" and it carries far. The bird raises its crest for display.



SIZE 25–32 cm (10–13 in) long

DIET Mainly invertebrates

HABITAT Open woodlands and grasslands

DISTRIBUTION
Africa, Europe, and Asia

Common kingfisher
Alcedo atthis

Stand by any river in Europe, and you might see a common kingfisher. As soon as it spots a fish from its perch, the bird dives in vertically, folding its wings as it enters the water. A membrane protects its eyes under water.

SIZE 16–17 cm (6.5 in) long

DIET Mainly fish

HABITAT Most aquatic habitats

DISTRIBUTION
Europe, Asia, and northern Africa

Red-billed hornbill
Tockus erythrorhynchus

One of the most common hornbills in Africa, the red-billed hornbill has a striking plumage of grey, white, and black. The male has a black patch on the lower part of its bill.

SIZE 42–45 cm (16.5–18 in) long

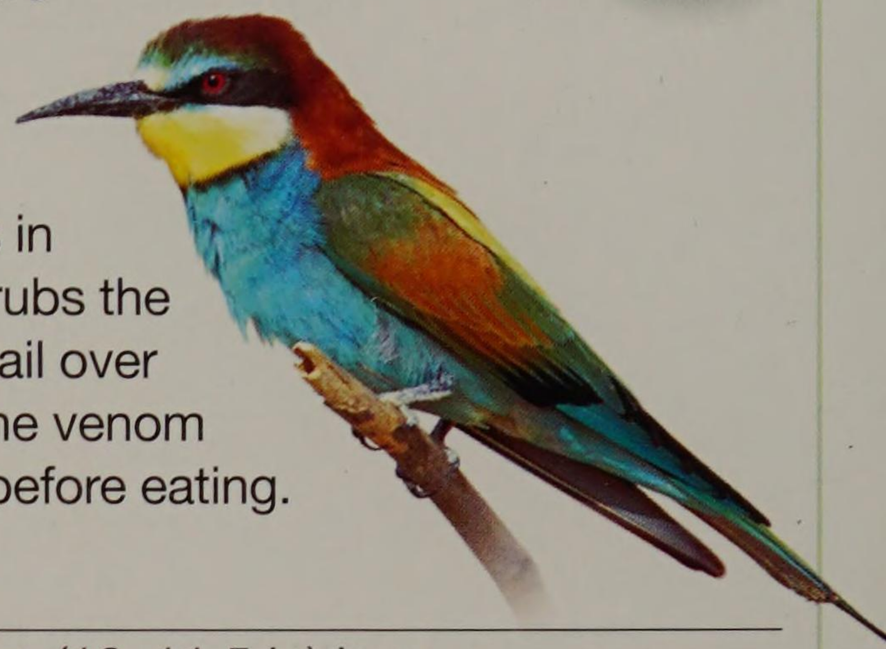
DIET Mainly insects

HABITAT Savanna and open woodlands

DISTRIBUTION West and southwest Africa, from Senegal to Namibia

European bee-eater
Merops apiaster

This colourful bird is the most widespread bee-eater. It catches insects in flight. The bird rubs the end of a bee's tail over a twig to take the venom out of its sting before eating.



SIZE 25–29 cm (10–11.5 in) long

DIET Insects, mainly bees

HABITAT River valleys, pastures, and temperate and tropical forests

DISTRIBUTION Africa and southwestern Eurasia

Lilac-breasted roller
Coracias caudatus

This bird sits on a high perch and looks for food below. Once it spots prey, it swoops down swiftly. It nests in a natural hole in a tree and mates for life.

SIZE 32–36 cm (13–14 in)

DIET Lizards and invertebrates, such as insects

HABITAT Dry woodlands

DISTRIBUTION South of the Sahara desert in Africa and the southern Arabian Peninsula

Jamaican tody
Todus todus

This bird's long, flat bill, with serrated edges and "whiskers" at its base, is well equipped to catch insects. The bird nests in muddy banks or rotten wood.

SIZE 11 cm (4.5 in) long

DIET Insects and insect larvae

HABITAT Mainly forests

DISTRIBUTION Jamaica

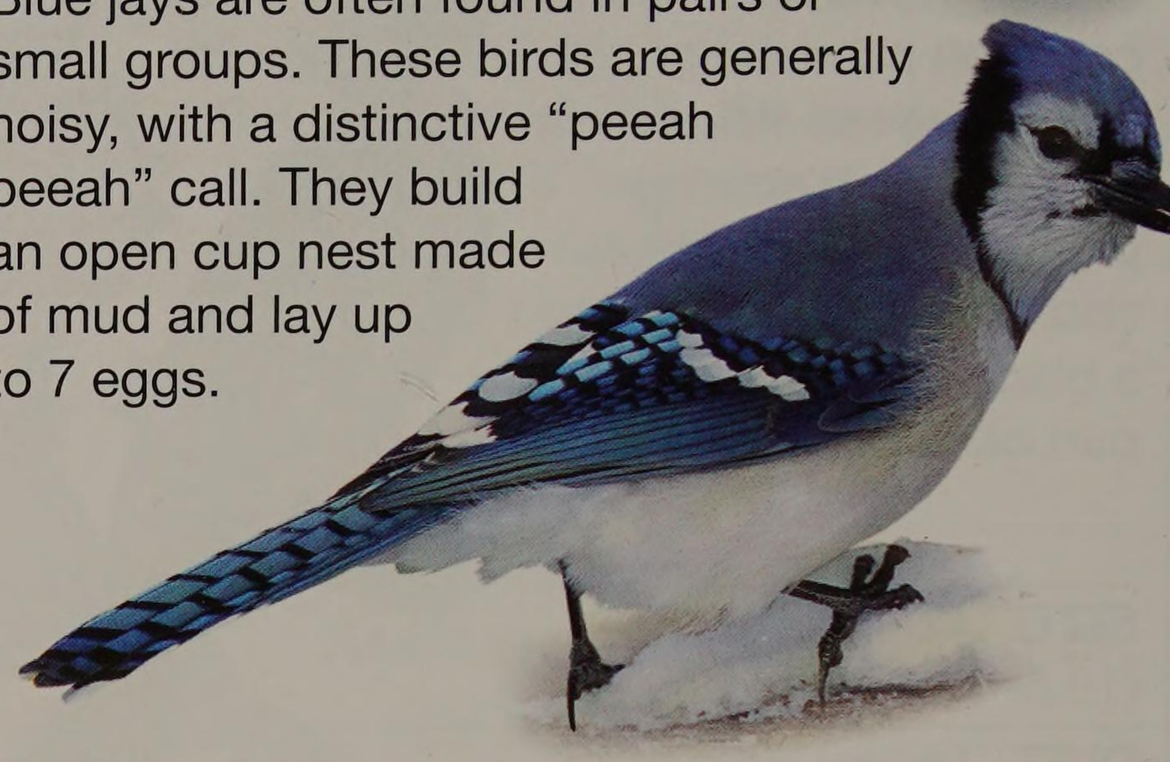
Songbirds

Most of the world's birds make up a group called the passerines. Many passerines can produce complex sounds, or songs, using an organ in the throat called a syrinx. These birds are called songbirds. Males sing songs to mark their territory or to attract females.

Blue jay

Cyanocitta cristata

Blue jays are often found in pairs or small groups. These birds are generally noisy, with a distinctive "peeah peeah" call. They build an open cup nest made of mud and lay up to 7 eggs.



SIZE 25–30 cm (10–12 in) long

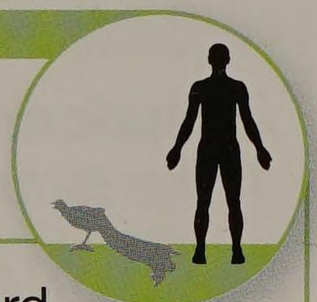
DIET Acorns, other nuts and seeds, and fruits

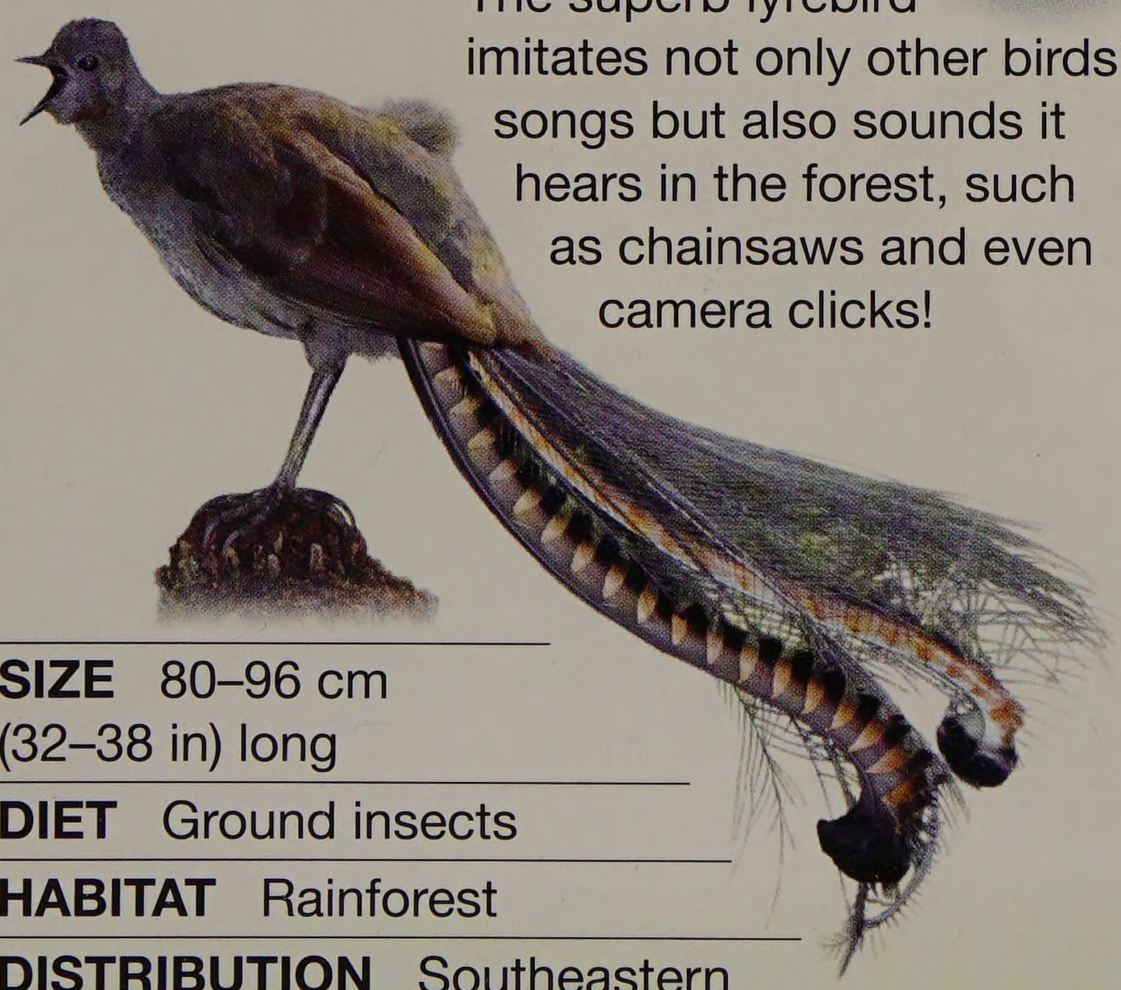
HABITAT Woods, parks, and gardens

DISTRIBUTION North America

Superb lyrebird

Menura novaehollandiae





The superb lyrebird imitates not only other birds' songs but also sounds it hears in the forest, such as chainsaws and even camera clicks!

SIZE 80–96 cm (32–38 in) long

DIET Ground insects

HABITAT Rainforest

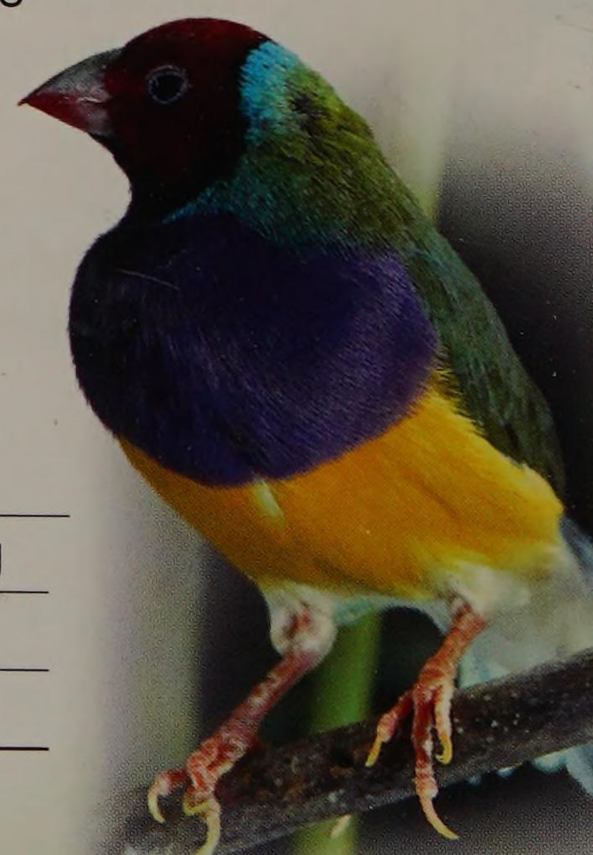
DISTRIBUTION Southeastern Australia and Tasmania

Gouldian finch

Erythrura gouldiae

ENDANGERED

Once abundant, the Gouldian finch has reduced greatly in numbers over the years. This is due to their capture for the pet trade, reduced food sources due to competition with other species, and habitat loss due to grazing.



SIZE 14 cm (5.5 in) long

DIET Grass seeds

HABITAT Grassy plains

DISTRIBUTION Northern Australia

Lesser bird of paradise

Paradisaea minor

The long feathers of a male lesser bird of paradise grow from its sides and not the wings. It displays them during mating. It raises its wings and shakes them to attract females. The females are, however, not brightly coloured.

SIZE 32 cm (13 in) long

DIET Mainly fruits

HABITAT Island forests

DISTRIBUTION Northern and western New Guinea

Several males gather at "lekking grounds" to dance and impress the females. The female chooses her mate after watching the displays.

Reptiles

Reptiles were the first vertebrates to live completely on land. Their skin is covered in waterproof scales. They form a layer that keeps moisture inside, helping reptiles to survive in hot, dry places. Most reptiles, including those that live mainly in water, lay eggs on land. The young hatch fully formed without a larval stage.

YOUNG ONES
Crocodile eggs have tough shells. The babies have an egg tooth, which cuts through the shell. Their mother may also lend a hand.

Reptiles

Reptiles are cold-blooded, egg-laying vertebrates. All reptiles have scales, which may differ in shape and size. To get rid of old, worn-out scales, many reptiles shed their outer layer of skin from time to time. This process is called moulting.

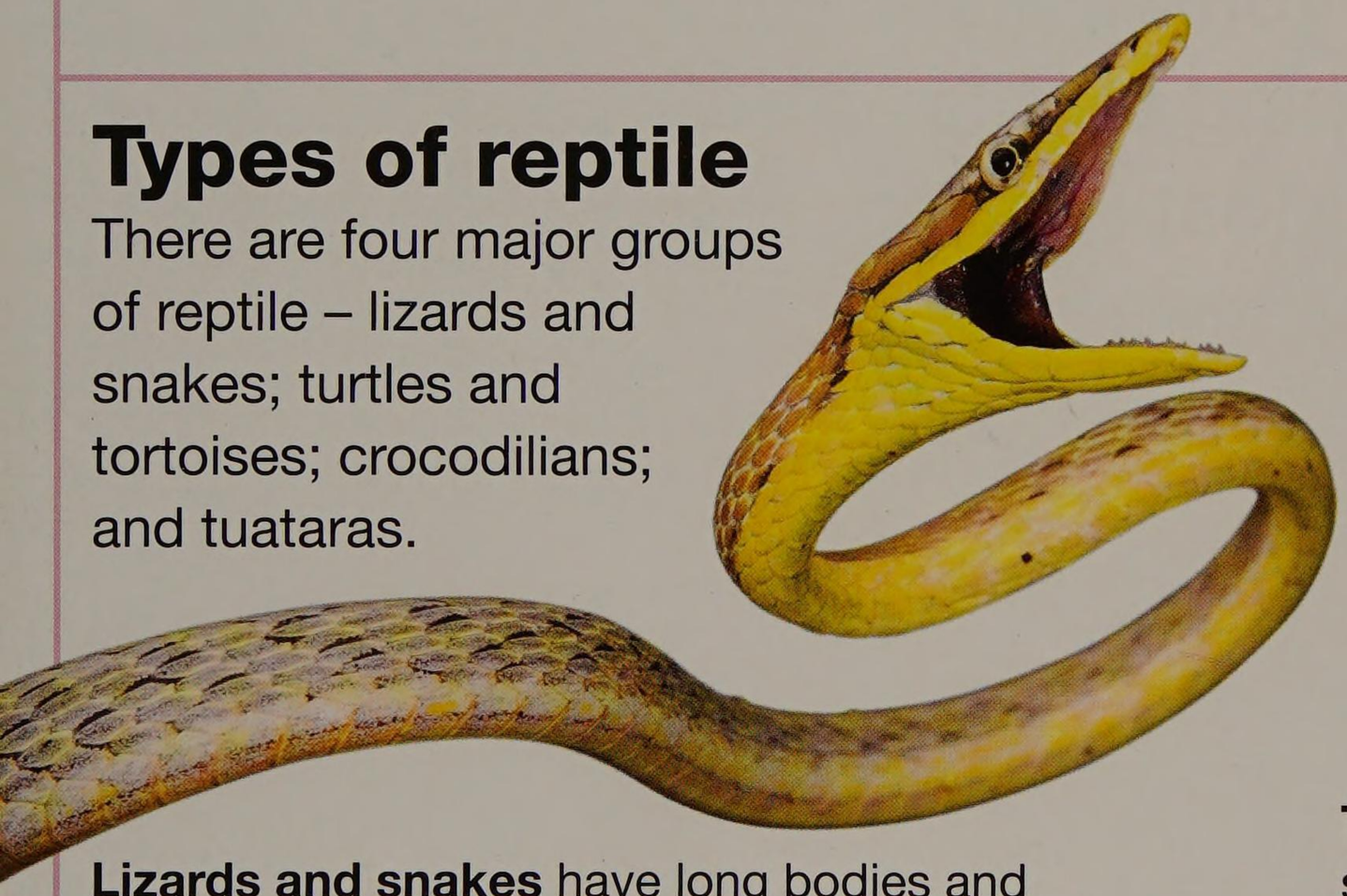
Young leopard tortoise crawling out

Birth

Reptiles lay eggs that often have a leathery shell, which allows water and oxygen to pass through to the developing animal inside. The shell protects the egg from drying out when laid out of water.

Types of reptile

There are four major groups of reptile – lizards and snakes; turtles and tortoises; crocodilians; and tuataras.



Lizards and snakes have long bodies and a scaly skin. They are found in all kinds of habitat – from deserts to mountains.

Shell is formed of many bones fused together and covered by hard plates called scutes

Turtles and tortoises have bony shells, stout limbs, and a toothless, beaklike mouth. They have changed little in the last 200 million years.

Tuataras have wedge-shaped teeth that set them apart from lizards. The closest relatives of tuataras became extinct 100 million years ago.

Crocodilians are large reptiles that spend most of their time in water. They have powerful jaws that make them fierce predators.

COLD-BLOODED

Reptiles are called cold-blooded, but it does not mean that their blood is chilly. It means their body temperature changes according to their surroundings. Many reptiles control their body temperature, however, by changing their surroundings. Agamas, for instance, bask in the Sun to warm up.

Chameleons have fused, **conelike eyelids** with a small opening for the pupil

Senses

Some reptiles rely on a combination of senses, while others, including chameleons, use one well-developed sense (sight, hearing, or smell). Chameleons can look in two different directions at the same time. They can use one eye to hunt for flying insects and the other to look out for attackers.

Turtles and tortoises

This group of reptiles has existed for about 200 million years, but is relatively unchanged in all that time. Turtles and tortoises have a hard shell that protects the soft body parts and sharp jaws used to cut food. Turtles live in oceans or fresh water, while tortoises live mostly on land.

Alligator snapping turtle

Macrochelys temminckii

The alligator snapping turtle is the world's largest freshwater turtle. It has a remarkable growth on the floor of its mouth that looks like a pink worm. Passing fish are attracted to what looks like a tasty meal, only to find the turtle's deadly jaws snapping shut. This turtle spends most of its time in the very sluggish flowing water of oxbow lakes and bayous.

SIZE 80 cm (32 in) long

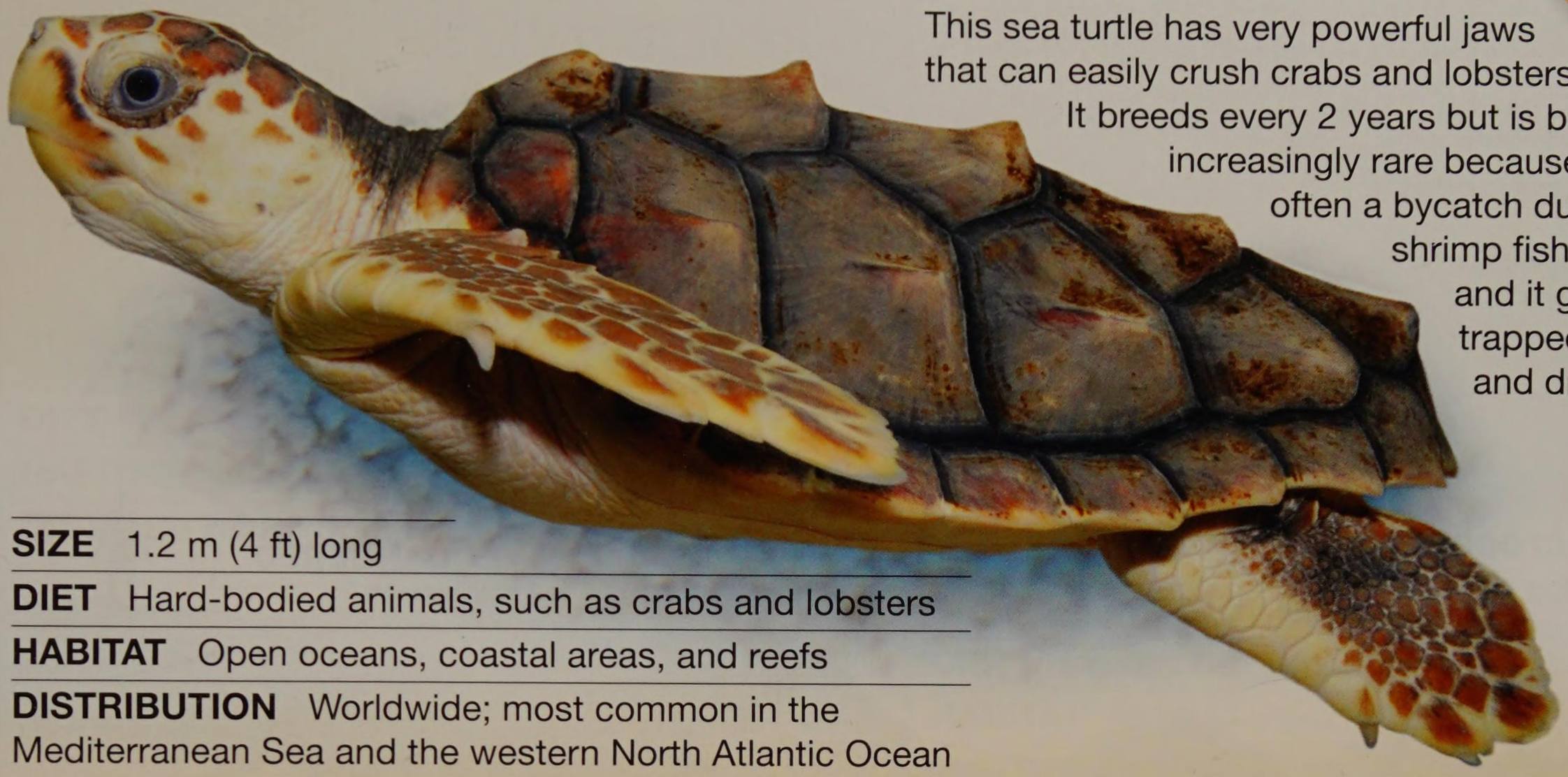
DIET Fish

HABITAT Deep waters of large rivers, canals, lakes, and swamps

DISTRIBUTION Southeastern USA

Loggerhead turtle
Caretta caretta

ENDANGERED



This sea turtle has very powerful jaws that can easily crush crabs and lobsters. It breeds every 2 years but is becoming increasingly rare because it is often a bycatch during shrimp fishing, and it gets trapped in nets and drowns.

SIZE 1.2 m (4 ft) long

DIET Hard-bodied animals, such as crabs and lobsters

HABITAT Open oceans, coastal areas, and reefs

DISTRIBUTION Worldwide; most common in the Mediterranean Sea and the western North Atlantic Ocean

Indian starred tortoise
Geochelone elegans

The scutes on its knobbly, high-domed shell help protect this tortoise. It is most active during the wet monsoon season.

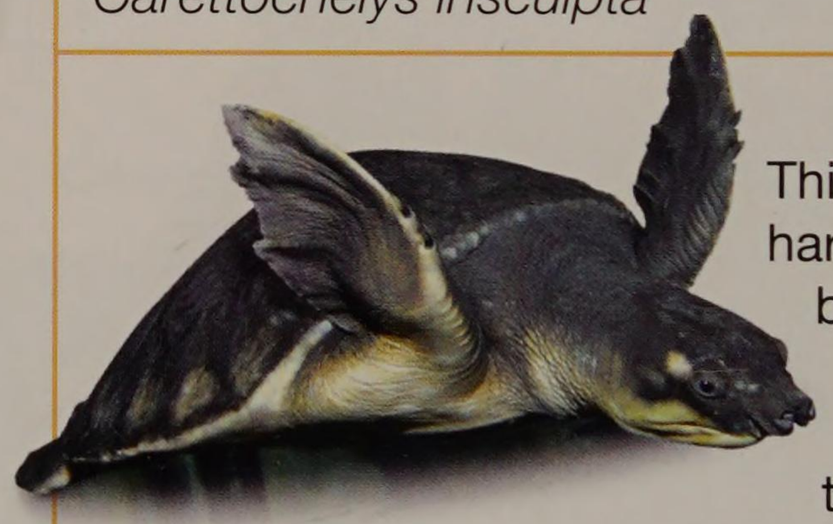
SIZE 38 cm (15 in) long

DIET Plants

HABITAT Deserts and dry scrublands

DISTRIBUTION India and Sri Lanka

Pig-nosed turtle
Carettochelys insculpta



This turtle lacks hard scutes on its body. Pig-nosed turtles use their unique snouts to breathe air while submerged in water. They swim with flipperlike limbs bearing claws.

SIZE 70 cm (28 in) long

DIET Snails, small fish, and fruits

HABITAT Rivers, streams, lagoons, and estuaries, with water up to 7 m (23 ft) deep

DISTRIBUTION New Guinea and northern Australia

Crocodilians

Meet the giants of the reptile world. Crocodiles, alligators, caimans, and gharials form this group of formidable predators that have powerful jaws and muscular tails. Most of them live in freshwater habitats.

Cuban crocodile

Crocodylus rhombifer

ENDANGERED

Teeth are pointed and sharp

This crocodile can be found only in the Zapata swamp in southwestern Cuba.

The Cuban crocodile spends more time on land than others do. When walking on land, it usually lifts its belly off the ground. Its strong hind limbs power it along when racing over short distances.

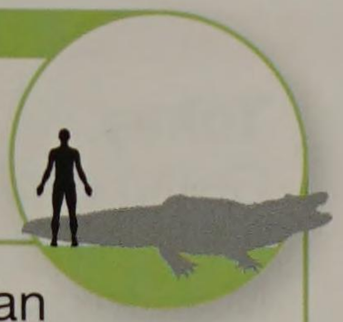
SIZE 3.5 m (11.5 ft) long

DIET Fish and small mammals

HABITAT Freshwater swamps

DISTRIBUTION Cuba

American alligator
Alligator mississippiensis



Unlike other crocodilians, the American alligator can survive in freezing conditions. It keeps its nostrils above the water surface and drops its body down to warmer water below. In warmer weather, the alligator floats partly submerged in water.

SIZE 5 m (16.5 ft) long

DIET Birds, small mammals, and turtles

HABITAT Lakes, swamps, and marshes

DISTRIBUTION Southeastern USA

Spectacled caiman
Caiman crocodilus

This caiman has a bony ridge between its eyes, making it seem like it is wearing spectacles. It rarely leaves the water, unless driven out by drought. This individual is a youngster.

SIZE 2.5 m (8.25 ft) long

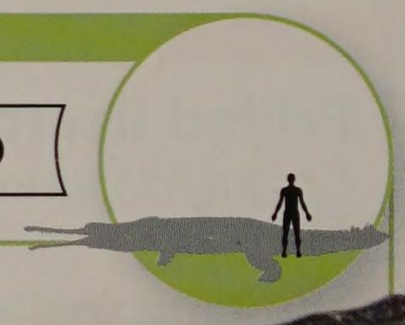
DIET Reptiles, fish, amphibians, and birds

HABITAT Most freshwater habitats

DISTRIBUTION Central and South America

Gharial
Gavialis gangeticus

ENDANGERED



One of the largest members of this group, a gharial spends most of its life in water. It can barely walk on land, so it "belly slides" across the ground. Its long, thin snout has interlocking jagged teeth and is ideal for holding struggling fish.

SIZE 7 m (23 ft) long

DIET Mainly fish, also birds or carrion

HABITAT Slow-moving backwaters of rivers

DISTRIBUTION Northern part of the Indian subcontinent

Lizards

There are more species of lizard than of any other reptile. They are suited to life in arid areas and are found everywhere but Antarctica. While most lizards have four legs, some underground species are legless. Amazingly, some lizards can shed their tail to escape a predator, but grow another to replace it.

Tokay

Gekko gecko

Male tokays make a loud "to-kay" call that gives this gecko its name. Like all geckos, it has sticky feet that enable it to climb easily, even on smooth surfaces. The tokay has a fierce bite.

SIZE 40 cm (16 in) long

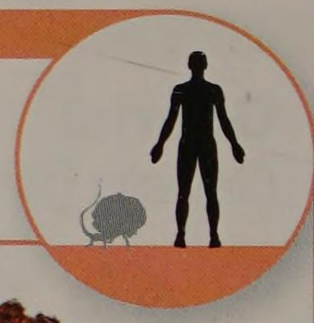
DIET Insects, small animals, and other tokays

HABITAT Forests and buildings

DISTRIBUTION Southeast Asia

Frilled lizard

Chlamydosaurus kingii



The large, leathery frill around the frilled lizard's neck gives this lizard its name. When it feels threatened, it opens its mouth and its umbrella-like frill, which makes it look much larger than it really is. It also rocks its body and hisses loudly. This may help to deter the predator, but if not, the lizard runs up the nearest tree.

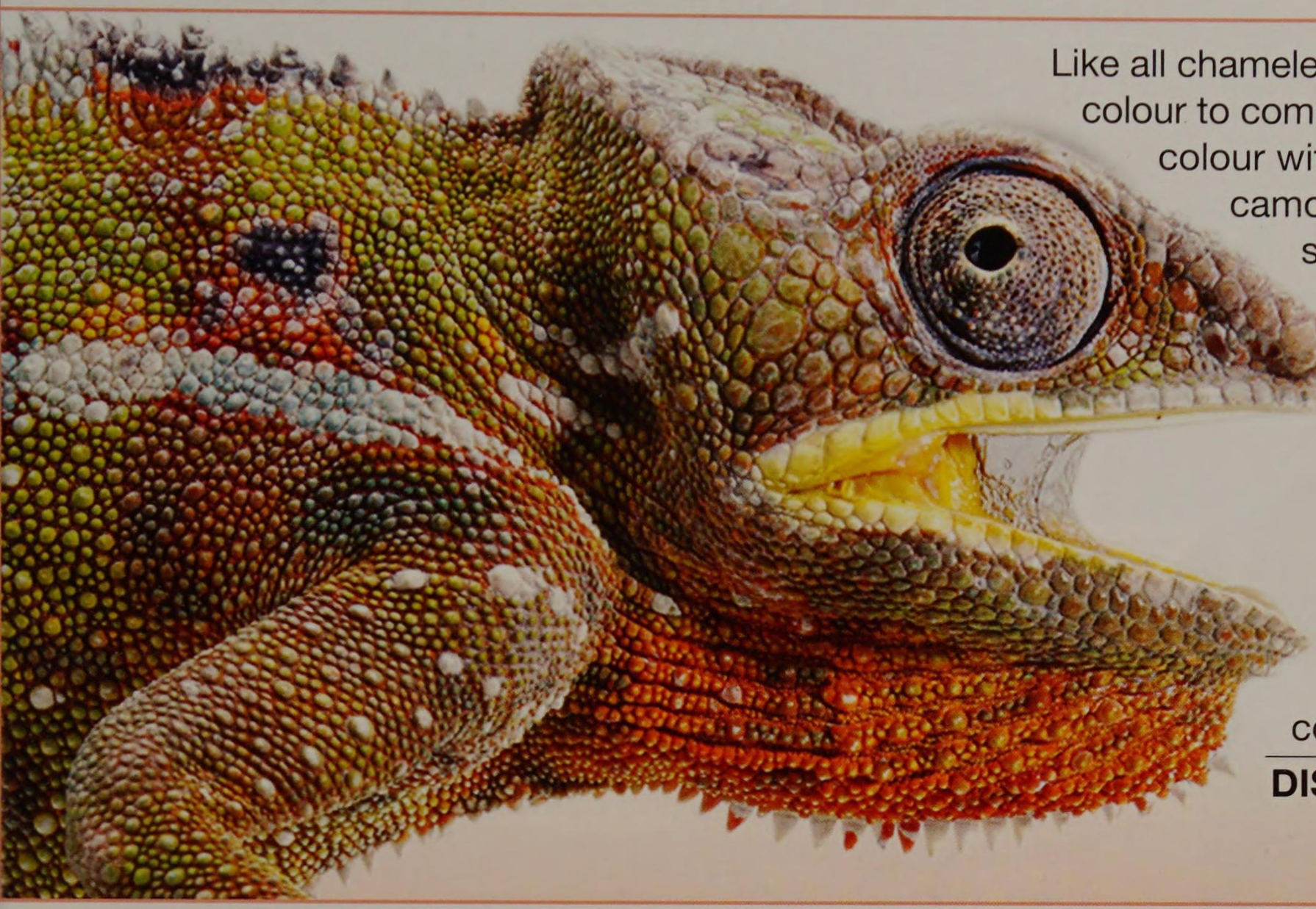
SIZE 90 cm (35 in) long

DIET Insects and other lizards

HABITAT Sub-tropical woodlands

DISTRIBUTION Australia

Panther chameleon
Furcifer pardalis



Like all chameleons, this lizard uses colour to communicate – its skin changes colour with its moods – and also for camouflage. Its sticky tongue is sometimes longer than its body and helps catch prey.

SIZE 46–56 cm (18–22 in) long

DIET Insects, such as crickets and mantids

HABITAT Deciduous tropical forests and coastal lowlands

DISTRIBUTION Madagascar

Marine iguana
Amblyrhynchus cristatus

This is the only lizard to dive in the ocean for food. Sturdy flattened tails help marine iguanas to swim against strong currents. They have special glands in their noses that sneeze out excess salt from their seaweed diet.

SIZE 0.7–1.5 m (2.3–5 ft) long

DIET Seaweed

HABITAT Coasts and shallow coastal seas

DISTRIBUTION Galápagos Islands

Fire skink
Lepidothyris fernandi

The fire skink's bright vivid colours make it a desirable pet. It is most active at twilight, when it goes foraging.

SIZE 35 cm (14 in) long

DIET Insects and spiders

HABITAT Forests

DISTRIBUTION West and central Africa

Snakes

Long, limbless bodies and flexible jaws are the key features of these predators. Snakes can't chew so they swallow their prey whole. The upper jaw is not joined to the skull and the lower jaw opens wide and is not joined at the front, giving snakes an enormous gape.

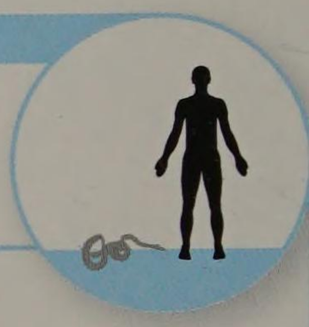
FOCUS ON...
HUNTING
Snakes hunt their prey using many different techniques.

▲ Boas kill by wrapping around their victims and suffocating them.

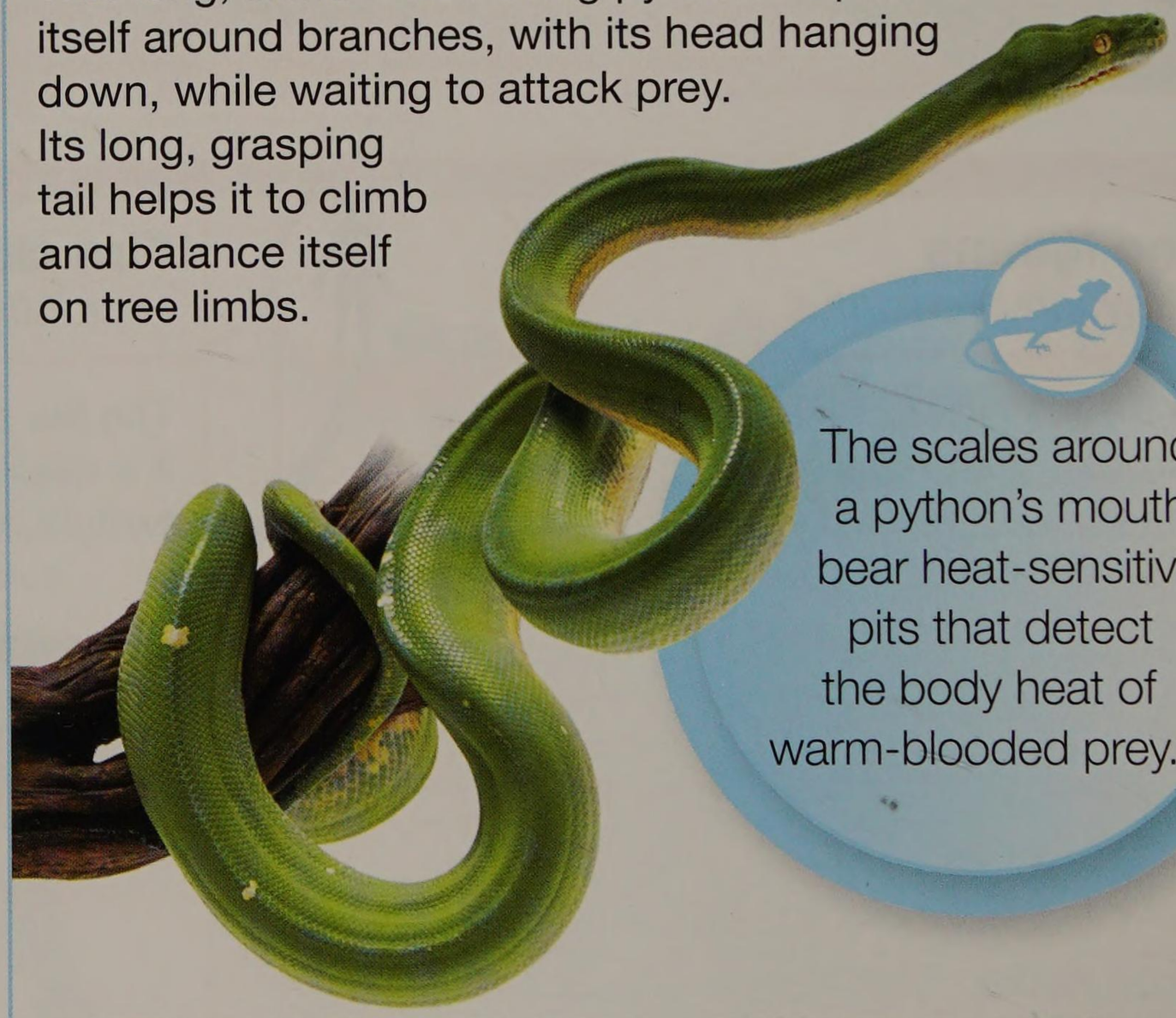
▲ Cobras use venom to kill prey. This one sprays venom in defence.

▲ Peringuey's adders lie hidden in sand with only the black tip of their tail showing, to lure lizards.

Green tree python
Morelia viridis



This long, slender tree-living python drapes itself around branches, with its head hanging down, while waiting to attack prey. Its long, grasping tail helps it to climb and balance itself on tree limbs.



The scales around a python's mouth bear heat-sensitive pits that detect the body heat of warm-blooded prey.

SIZE 1.8–2.4 m (6–8 ft) long

DIET Lizards and small mammals

HABITAT Tropical forests

DISTRIBUTION New Guinea and surrounding islands and northern Australia

Egyptian cobra
Naja haje

Mainly active at night, the Egyptian cobra is sometimes seen basking in the morning Sun. If threatened, it rears up, spreads its hood, and hisses loudly. If this doesn't work, it delivers a venomous bite, which is often fatal to humans.

SIZE 1–2.4 m (3.3–8 ft) long

DIET Small vertebrates

HABITAT Deserts and grasslands

DISTRIBUTION Northwestern and East Africa

Mouth open wide to intimidate

Prairie rattlesnake
Crotalus viridis

Like all rattlesnakes, this snake warns would-be predators of its venomous bite by rattling its tail. It rattles due to a build-up of layers of old, dead scales, producing a warning "buzz". Prairie rattlesnakes hunt at night.

Rattle

SIZE 1.2 m (4 ft) long

DIET Birds, mammals, and reptiles

HABITAT Grasslands, deserts, and scrublands

DISTRIBUTION Mid-western USA, Mexico, and southern mid-western Canada

Common boa
Boa constrictor

This snake is an ambush predator, hunting by sight and smell. It lies in wait for prey, striking out when its victim comes within reach. The boa seizes its prey in its jaws before wrapping itself around the animal and suffocating it. Small animals may be killed in seconds.

SIZE Up to 4 m (13 ft) long

DIET Mammals, birds, and reptiles

HABITAT Open woodlands and scrublands

DISTRIBUTION Central and South America

Amphibians

The word amphibian comes from the Greek word *amphibios*, meaning "both lives". Most amphibians are adapted for life on both land and in water. Young ones have gills, which take oxygen from water. Adults of certain species retain their gills and continue living in water, while many develop air-breathing lungs for a life on land. Some land-living amphibians do not develop lungs at all, breathing through their skin instead.

FEATHERY GILLS
A newborn salamander breathes through its long feathery gills. When it becomes an adult, the gills shrink and it begins breathing through lungs.

Amphibians

This group includes newts and salamanders, frogs and toads, and caecilians. There are three stages in the life of most amphibians – egg, larva, and adult. Being cold-blooded, they do not need much energy to maintain their body temperature so they may go for long periods without feeding. Their skin is moist and most species can use it to absorb oxygen and get rid of carbon dioxide.

Jumping

Frogs launch themselves into the air using their strong, long back legs. The front legs are bowed outwards to absorb the shock of landing.

Large **thigh muscles** help to power the jump

Large, **feathery** gills

Gills and lungs

Young amphibians breathe using external gills. Some salamanders retain these in their adult stage as well. Most frogs, toads, and salamanders on land have lungs but can also absorb some oxygen through their skin.

Life cycle

Most amphibians start life in water, as an egg. This hatches into a larva (often called a tadpole in frogs and toads). A newt larva looks like a little fish and breathes through gills and skin. It develops lungs and changes into an adult that can also live on land.

Newt larva hatches after two weeks

Egg laid by adult

Larva changes into adult after three to four months

Transparent inner eyelid protects eye under water

Eardrum is on the outside of the head

Parenting

Most amphibians lay eggs in water. However, some species lay their eggs in damp places on land. Eggs may be laid individually or in clumps. The dusky salamander guards its eggs for 4–5 months till they hatch.

CAECILIANS

These wormlike animals form the smallest of the three major groups of amphibian. Caecilians lack limbs and spend their lives burrowing in moist soil.

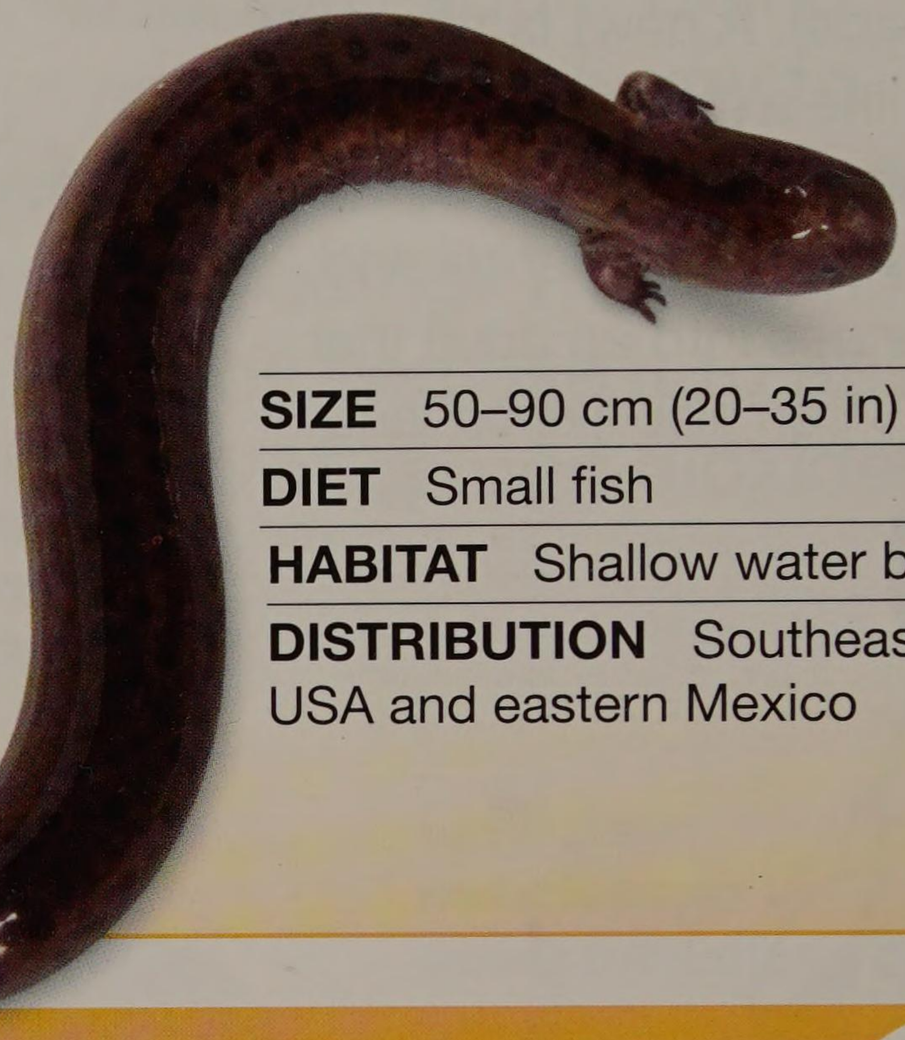
Salamanders and newts

These are amphibians with slender bodies and long tails. Most have four legs, but like frogs, they begin life as legless, water-living larvae with a finlike tail. Only some of them leave water as adults.

Greater siren

Siren lacertina

This large, long, eel-like animal spends its entire life in water. It has only one pair of legs, behind its feathery, external gills.



SIZE 50–90 cm (20–35 in) long

DIET Small fish

HABITAT Shallow water bodies

DISTRIBUTION Southeastern USA and eastern Mexico

Fire salamander

Salamandra salamandra

The fire salamander is active mainly at night. The colourful markings on its skin warn predators that it is poisonous.

SIZE 18–28 cm (7–11 in) long

DIET Worms, slugs, insects, and insect larvae

HABITAT Forests

DISTRIBUTION Europe

Great crested newt

Triturus cristatus

These newts normally live on land and breed in ponds. In the summer, the male develops a striking crest on its back to attract potential mates. Once the female lays an egg, she wraps it in a leaf before laying another.

SIZE 10–18 cm (4–7 in) long

DIET Tadpoles, worms, insects, and their larvae

HABITAT Ponds, lakes, and ditches

DISTRIBUTION Europe and central Asia

Japanese giant salamander
Andrias japonicus

The Japanese giant salamander is the second largest amphibian in the world after its relative the Chinese giant salamander. Its deeply folded skin helps it to absorb oxygen from water. These salamanders hunt at night. Some have been known to live for more than 50 years.

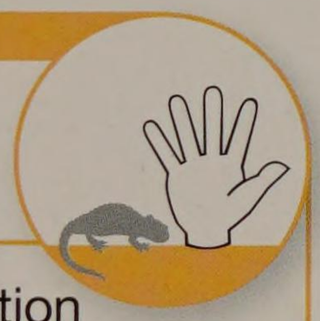
SIZE 1–1.4 m (3.3–4.5 ft) long

DIET Fish, worms, and crustaceans

HABITAT Rivers and streams

DISTRIBUTION Japan

Crocodile newt
Tylototriton verrucosus



This newt has a bright orange colouration that warns predators to stay away. It spends winters and dry periods underground.

SIZE 12–18 cm (4.75–7 in) long

DIET Mainly invertebrates

HABITAT Forests

DISTRIBUTION Southern and southeast Asia

Axolotl
Ambystoma mexicanum **ENDANGERED**

Axolotls have flat finlike tails and external gills – features that many salamanders lose as they mature. This animal retains its juvenile form throughout adulthood.

SIZE 10–30 cm (4–12 in) long

DIET Mainly invertebrates, such as worms, molluscs, and insect larvae

HABITAT Lakes

DISTRIBUTION Mexico

Studying the sticky feet of treefrogs may help scientists design

self-cleaning surfaces

and long-lasting glues

GÜNTHER'S BANDED TREEFROG

This treefrog among forest-floor mushrooms is called Günther's banded treefrog. It is active only at night and is mostly found on trees in South America's tropical rainforests. Treefrogs form the staple diet of many types of snake.

Frogs and toads

Long, powerful hind limbs and the lack of a tail set the frogs and toads apart from other amphibians. Frogs swallow prey whole, but they are not toothless – most grip prey with small teeth in their upper jaw. Some land-living frogs with warty skin are called toads.

FOCUS ON...
FEET
Different kinds of feet enable various frogs to live in a wide range of habitats.

▲ Treefrog toepads grip vertical surfaces due to sticky mucus and their fine, microscopic structure.

▲ Aquatic frogs' feet are webbed to form a swimming paddle.

▲ The giant burrowing frog has horny "tubercles" on its hind feet, which help it to dig into soil.

Cane toad
Rhinella marinus

This amphibian is the largest toad and also one of the most poisonous. A highly toxic juice oozes out of its shoulders if it is threatened. The clutch size of this toad is between 8,000 and 17,000.

SIZE	10–24 cm (4–9.5 in) long
DIET	Invertebrates on land and other frogs
HABITAT	Sand dunes, mangroves, and coastal heaths
DISTRIBUTION	Central and South America; introduced to Australia

Orange-legged leaf frog

Phyllomedusa hypochondrialis

Like other treefrogs, the orange-legged leaf frog has long, slender limbs and can climb trees swiftly. It gives off an unpleasant odour to deter predators, and may even pretend to be dead to avoid being eaten.

SIZE 4–5 cm (1.5–2 in) long

DIET Insects

HABITAT Grasslands, rainforests, and pastureland

DISTRIBUTION Northern to central South America

Darwin's frog

Rhinoderma darwinii

This frog is named after the famous scientist Charles Darwin, who discovered it in Chile. Males are caring parents and brood their eggs by storing them inside their vocal sacs. When the eggs hatch, the tadpoles emerge from their throat.

SIZE 2–3 cm (0.75–1.25 in) long

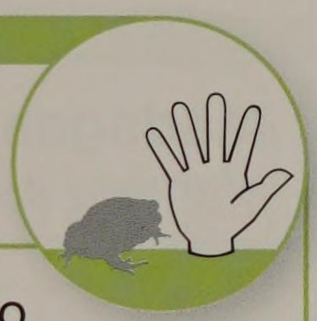
DIET Insects and other small animals

HABITAT Mountain forests

DISTRIBUTION Chile and Argentina

Tomato frog

Dyscophus antongilii



The tomato frog spends the day lying buried in soil and emerges at night to hunt. It gives out a sticky secretion to protect itself from predators. This frog is also a popular pet.

SIZE 8–12 cm (3.25–4.75 cm) long

DIET Small insects and other invertebrates

HABITAT Rainforests

DISTRIBUTION Madagascar

Asian horned frog

Megophrys nasuta

This horned frog lives on the forest floor. Its "horns" and folds of skin look like dry leaf edges and help the frog to hide among dead leaves while it waits for prey.

SIZE 7–14 cm (2.75–5.5 in) long

DIET Smaller frogs, scorpions, crabs, and other invertebrates

HABITAT Tropical forests

DISTRIBUTION Southeast Asia

Fleischmann's glass frog
Hyalinobatrachium fleischmanni

Glass frogs have translucent skin on the underside through which their internal organs are visible. Deforestation is shrinking the habitat of this frog.

SIZE 2–3 cm (0.75–1.25 in) long

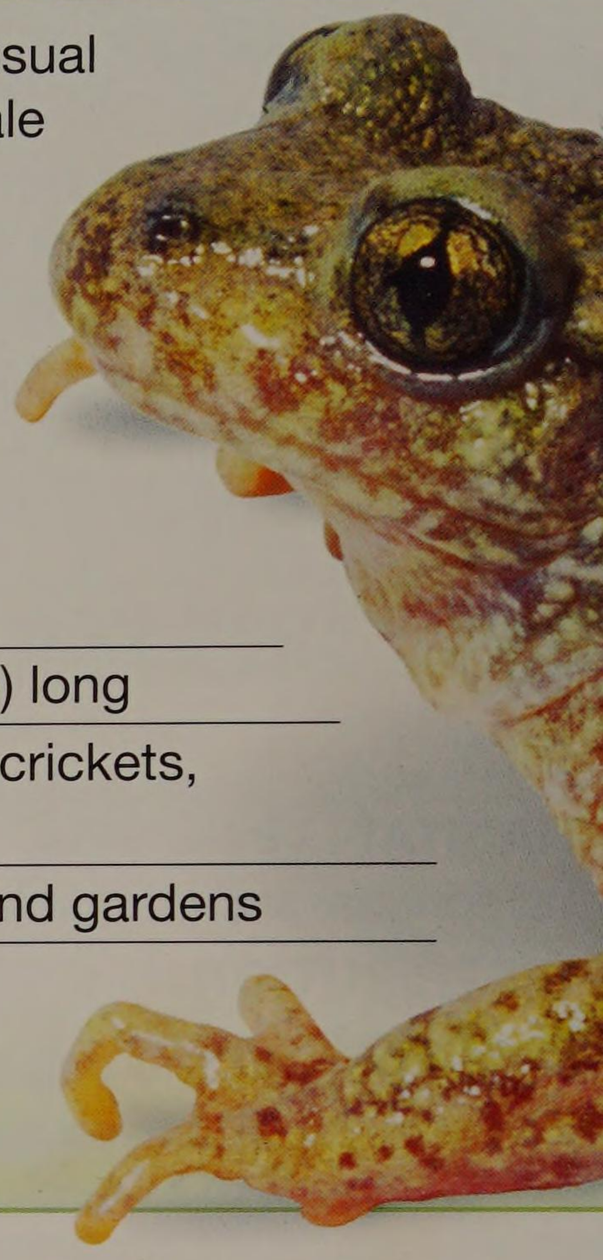
DIET Insects

HABITAT Tropical forests and wetlands

DISTRIBUTION Central and South America

Midwife toad
Alytes obstetricans

This toad has a very unusual breeding style. The female lays strings of large, yolk-filled eggs and transfers them to the male's back. The male then looks after the eggs until they hatch.



SIZE 3–5 cm (1.25–2 in) long

DIET Spiders, beetles, crickets, caterpillars, and snails

HABITAT Woodlands and gardens

DISTRIBUTION
Western and central Europe

Strawberry poison-dart frog
Oophaga pumilio

The strawberry poison-dart frog has several colour variations – from brilliant blue or red to dull brown. Females carry the tadpoles and deposit them singly in tiny ponds in bromeliads (plants with vase-shaped leaves). They later feed them with their unhatched eggs.

SIZE 2–2.5 cm (0.75–1 in) long

DIET Small arthropods, mainly ants and bugs

HABITAT Tropical forests

DISTRIBUTION Southern Central America

Madagascan golden mantella
Mantella aurantiaca

African bullfrog

Pyxicephalus adspersus

During droughts, African bullfrogs can remain underground, encased in a watertight cocoon, for several years. They emerge to breed after heavy rain. Males guard both the eggs and tadpoles. They also dig channels so that the tadpoles can reach open water.

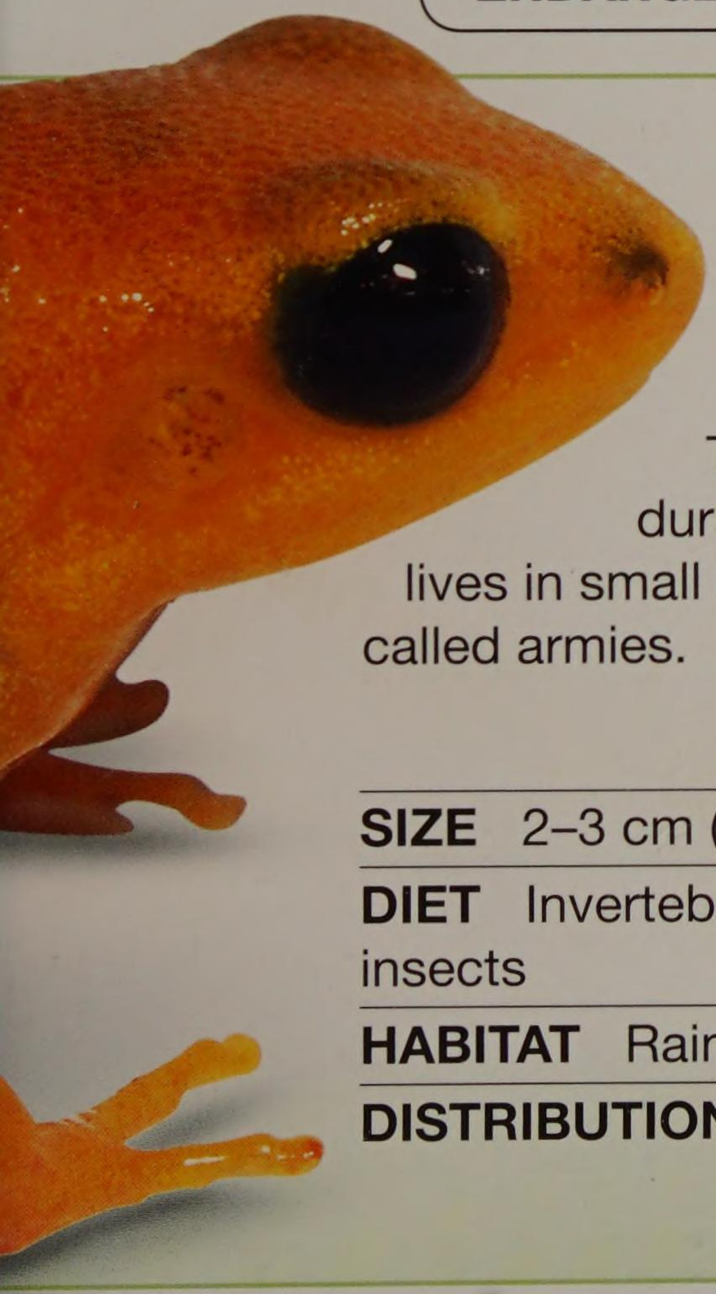
SIZE 8–23 cm (3.25–9 in) long

DIET Small insects and other frogs

HABITAT Wet and dry savanna

DISTRIBUTION Sub-Saharan Africa

ENDANGERED



This Madagascan frog's bright colours warn that it secretes toxins. This frog is active during the day, and lives in small mixed-sex groups called armies.

SIZE 2–3 cm (0.75–1.25 in) long

DIET Invertebrates, such as insects

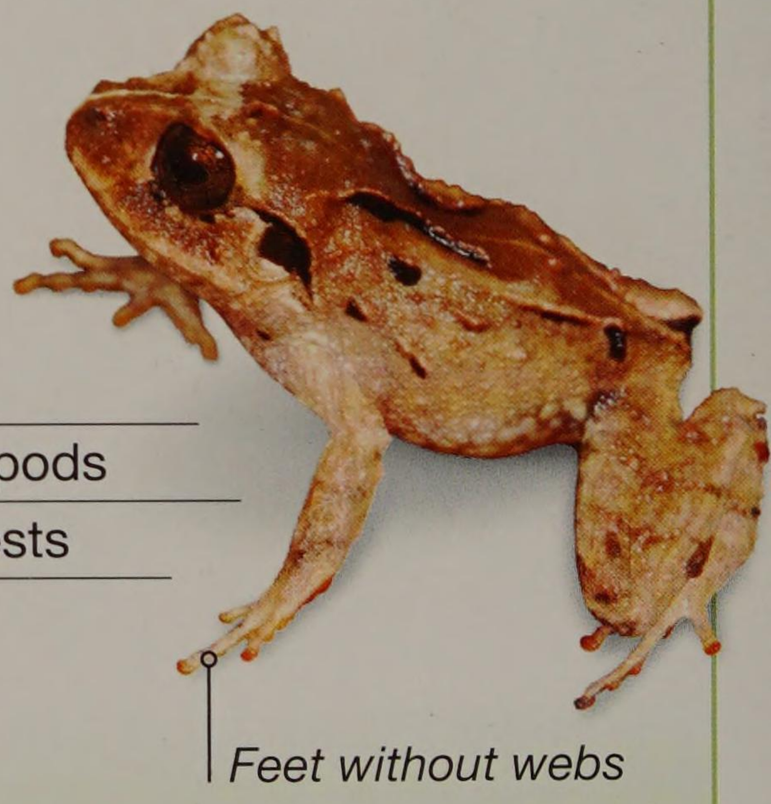
HABITAT Rainforests

DISTRIBUTION Madagascar

Broad-headed rain frog

Craugastor megacephalus

This frog dwells in leaf litter and even lays eggs there. It hides in a burrow and sits at the entrance at night, catching prey as they pass by. Its eggs hatch directly into small frogs.

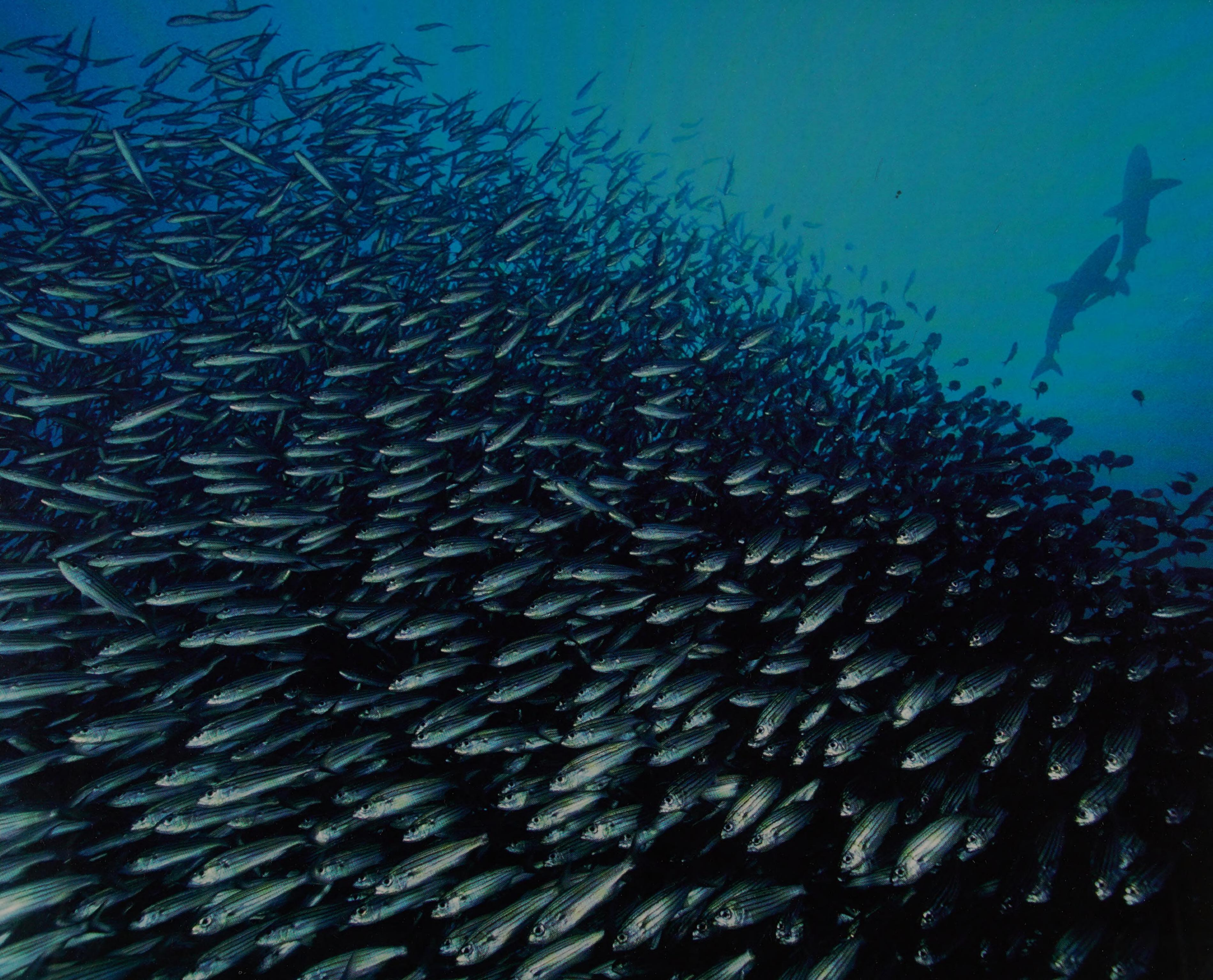


SIZE 3–7 cm (1.25–2.75 in) long

DIET Small arthropods

HABITAT Rainforests

DISTRIBUTION Central America



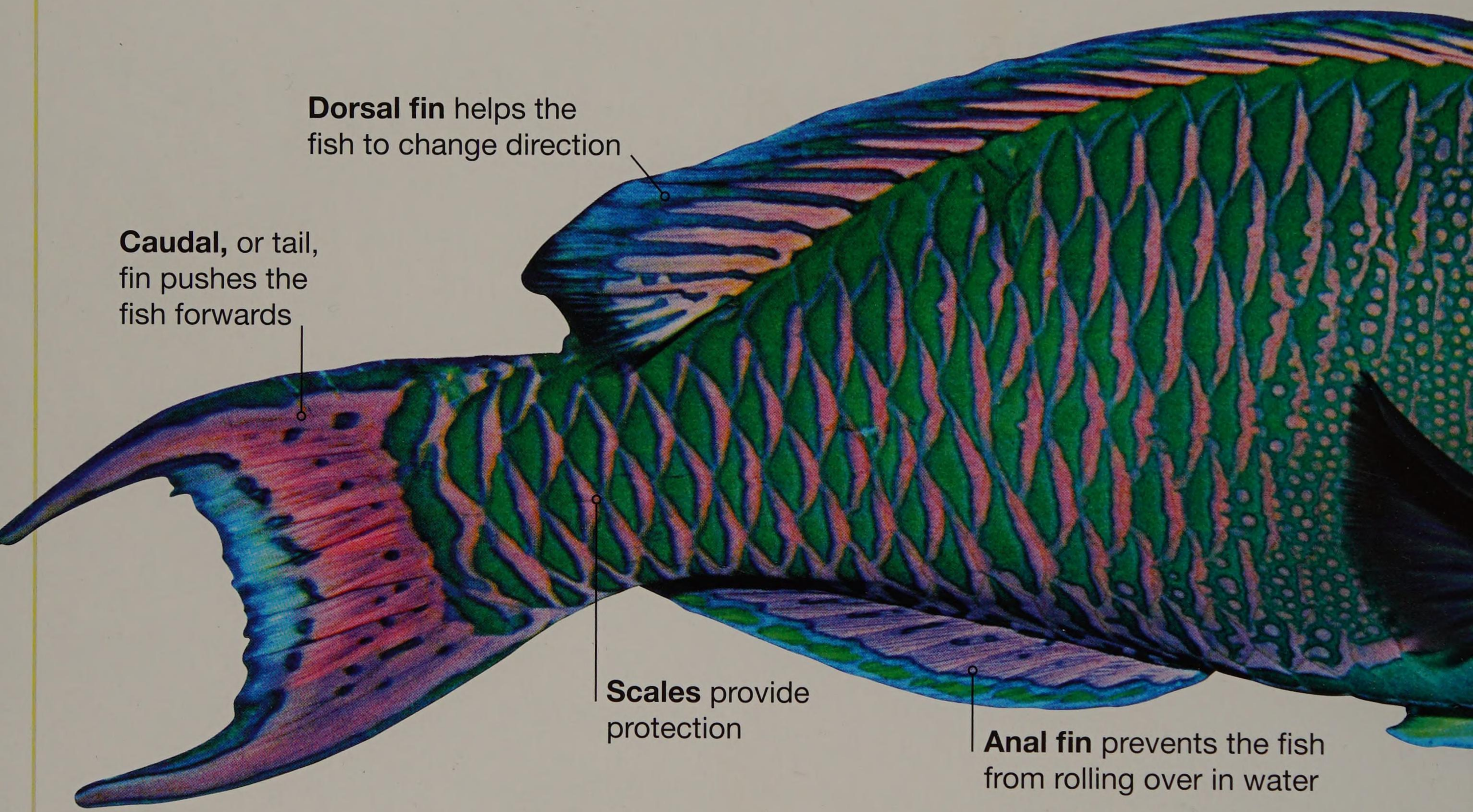
Fish

Fish were the first animals with backbones to appear on Earth, at least 500 million years ago. These cold-blooded animals have organs called gills, and in most of them the gills filter oxygen from water. Most have scales and fins. Many small fish swim in shoals, moving as one. They are safer in a shoal because it is difficult for predators to pick out a single fish.

SHARKS AND RAYS
Most fish are bony, but sharks and rays are completely different – their skeleton is made of springy cartilage.

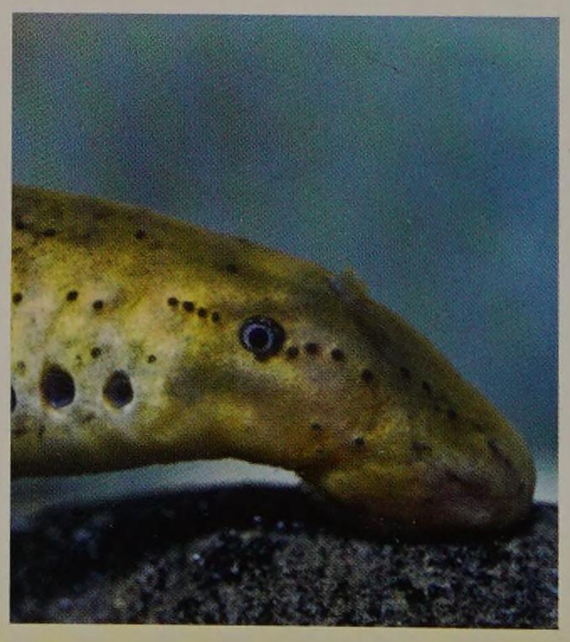
Fish

Fish are adapted for life in water – they steer through the water using streamlined fins and use gills to absorb oxygen. Their skin has glands that secrete mucus, which protects them from bacteria. Most fish have special sensory organs that detect vibrations of other animals in water.



Groups of fish

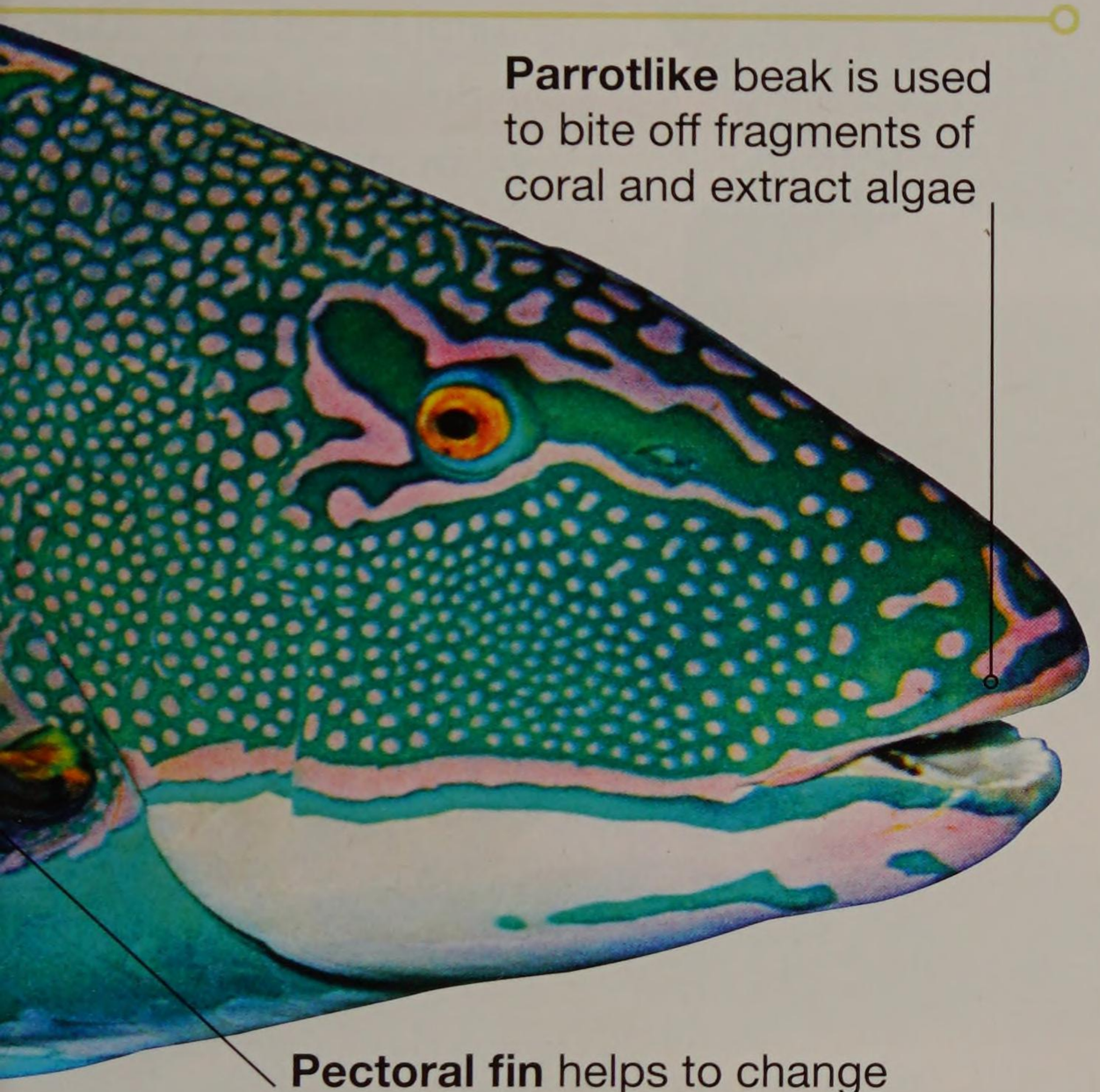
There are more than 31,000 species of fish, which fall into three groups – jawless, cartilaginous, and bony. Each of these groups had a different ancestor and evolved independently of one another.



Jawless fish
Unlike other vertebrates, jawless fish do not have biting jaws. Instead they have sucker discs with a rasping tongue and small teeth made of keratin.

Living together

Some fish have highly specialized lifestyles. This bluestreak cleaner wrasse eats parasites on other fish, which often visit the wrasse's "cleaning station" for the service it provides.



Parrotlike beak is used to bite off fragments of coral and extract algae

Pectoral fin helps to change direction and can also be used for tasting and touching

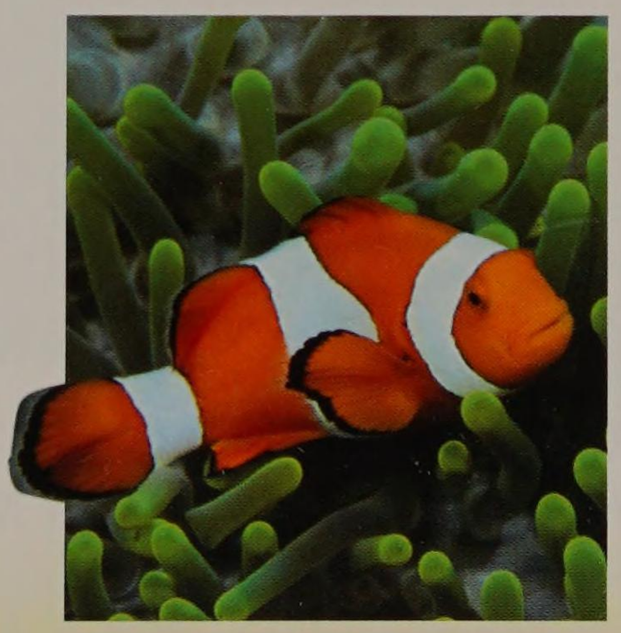
HAGFISH

Despite its name, this strange-looking animal is not actually a vertebrate. It has no backbone. It is closely related to vertebrates, though, and like them, it has a cranium, or skull.

Reproduction

Most fish produce a large number of eggs but do not provide them with any care. However, mouth brooders, such as the male jawfish, provide a safe nest for the tiny eggs in their huge mouth until the eggs hatch.

Cartilaginous fish
These fish have a skeleton made of cartilage instead of hard bone. Most are predators with sharp senses.



Bony fish
These include ray-finned fish and lobe-finned fish. They have a hard bony skeleton and a swim bladder. They swim with more precision than cartilaginous fish.

Jawless fish and lobefins

The lampreys are the only jawless fish. They hold on to other fish with their suckerlike mouths and rasp off flesh with their teeth. The lobefinned fish form an unrelated group. They have fleshy fins that they sometimes use to "walk" on the sea or river bed.

Brook lamprey

Lampetra planeri

These lampreys stop feeding entirely as soon as they become adults and only spawn, dying soon afterwards.

Unlike most lampreys, this fish does not migrate to the sea. Adults spawn in the spring. The young are born blind and stay hidden in the river bed for about 6 years, with their mouths exposed for filter feeding.

SIZE 16 cm (6.5 in) long

DIET Diatoms, algae, and dead matter

HABITAT Streams, lakes, and rivers

DISTRIBUTION Northern Europe and southeastern Alaska

Coelacanth
Latimeria chalumnae

ENDANGERED

Coelacanths belong to a group that was thought to have died out 65 million years ago, until one was caught in 1938. Their pectoral fins are very mobile and help the fish to manoeuvre in tight spaces, when looking for food.

SIZE 2 m (6.5 ft) long

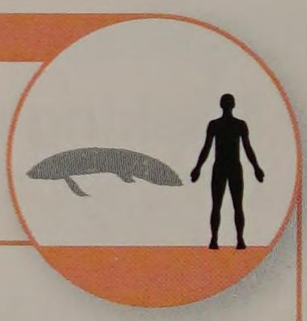
DIET Squid and fish

HABITAT Steep, rocky underwater terrain

DISTRIBUTION Seas off the Comoros Islands, Indian Ocean

Fin has a fleshy stalk, or lobe

Australian lungfish
Neoceratodus forsteri



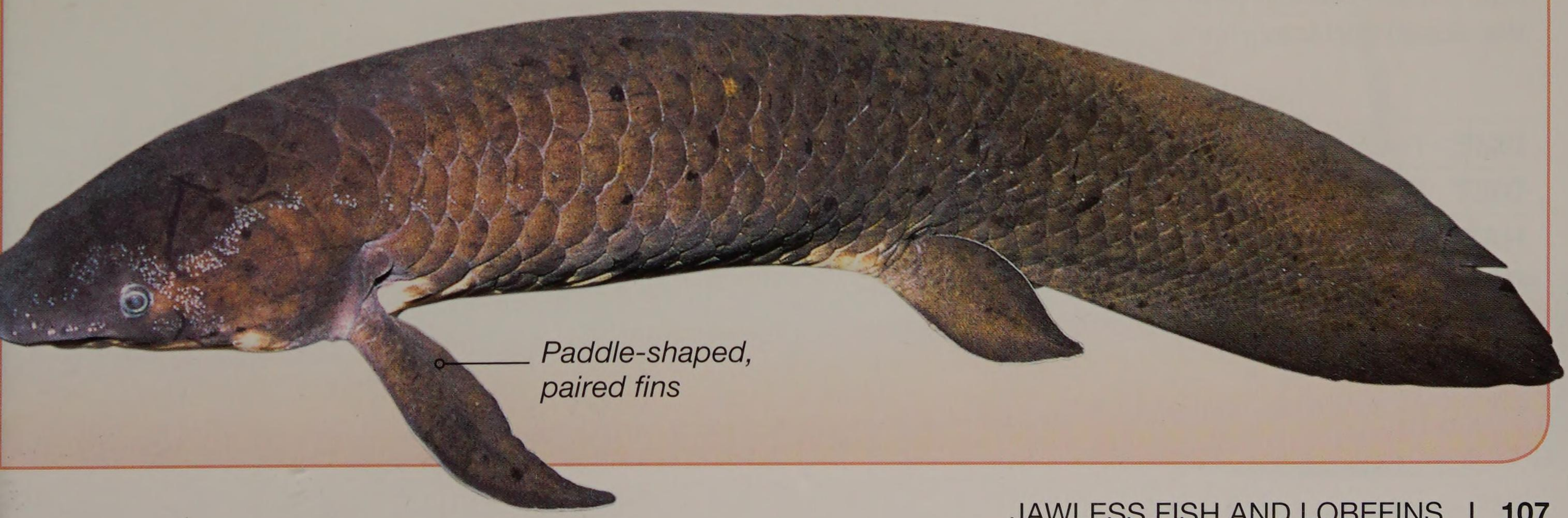
Unlike other lungfish, which inhabit pools that may dry up, the Australian lungfish lives in permanent bodies of water with dense vegetation. When the level of oxygen in the water falls during dry periods, it gulps air at the surface and breathes using its single lung.

SIZE 1.8 m (6 ft) long

DIET Frogs, crabs, molluscs, and small fish

HABITAT Deep pools and rivers

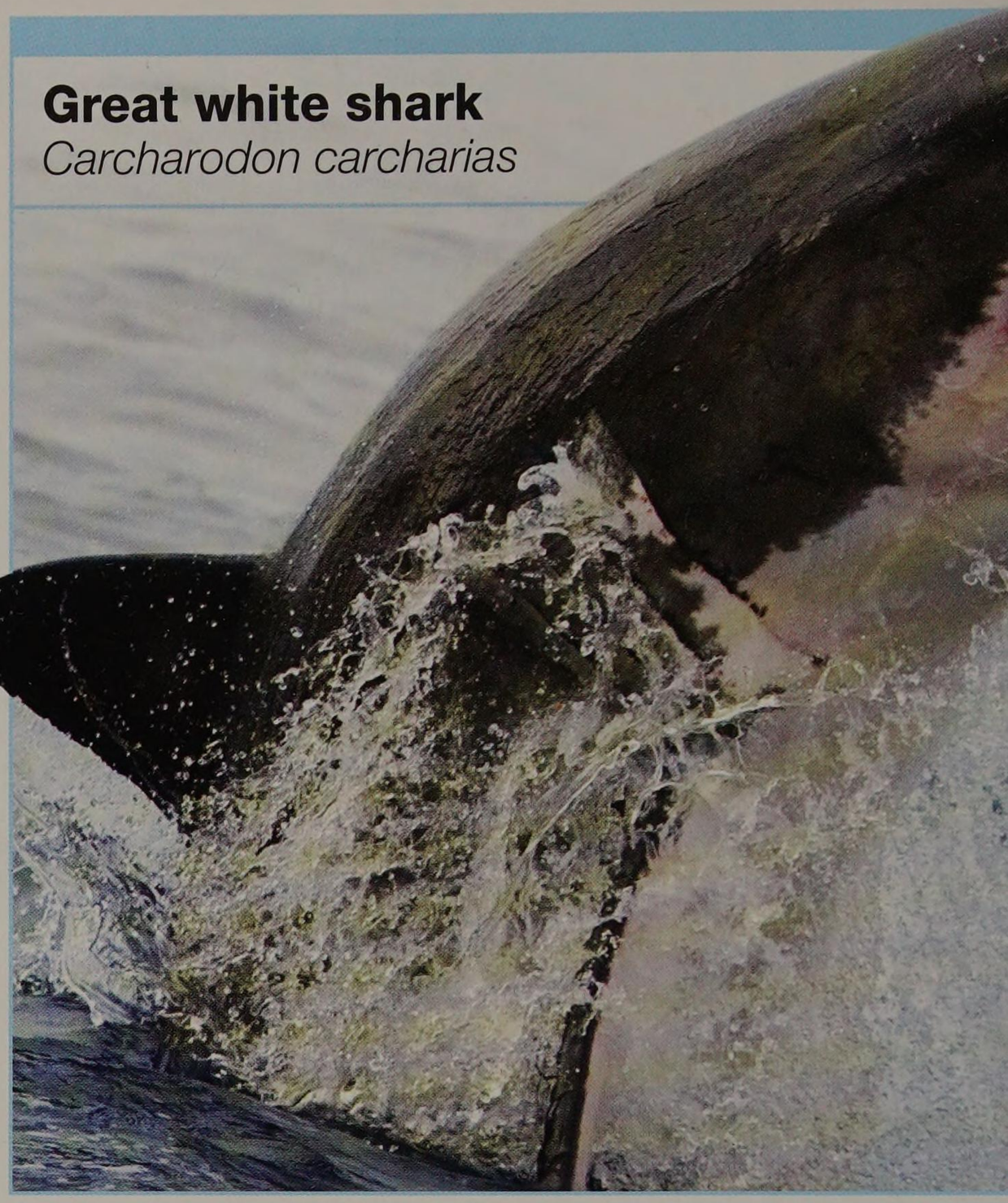
DISTRIBUTION Eastern Australia



Sharks and rays

Sharks are hunters with torpedo-shaped bodies, powerful jaws, sharp teeth, and a keen sense of smell. Skates and rays are cousins of sharks with broad, flat bodies. They swim by flapping their winglike fins.

Great white shark
Carcharodon carcharias



Basking shark
Cetorhinus maximus

This is the world's second largest fish, after the whale shark. It feeds by swimming with its vast mouth gaping wide. Food is trapped on its gill rakers (comblike structures on its gills) as the water passes out. It often basks in the Sun at the ocean surface.

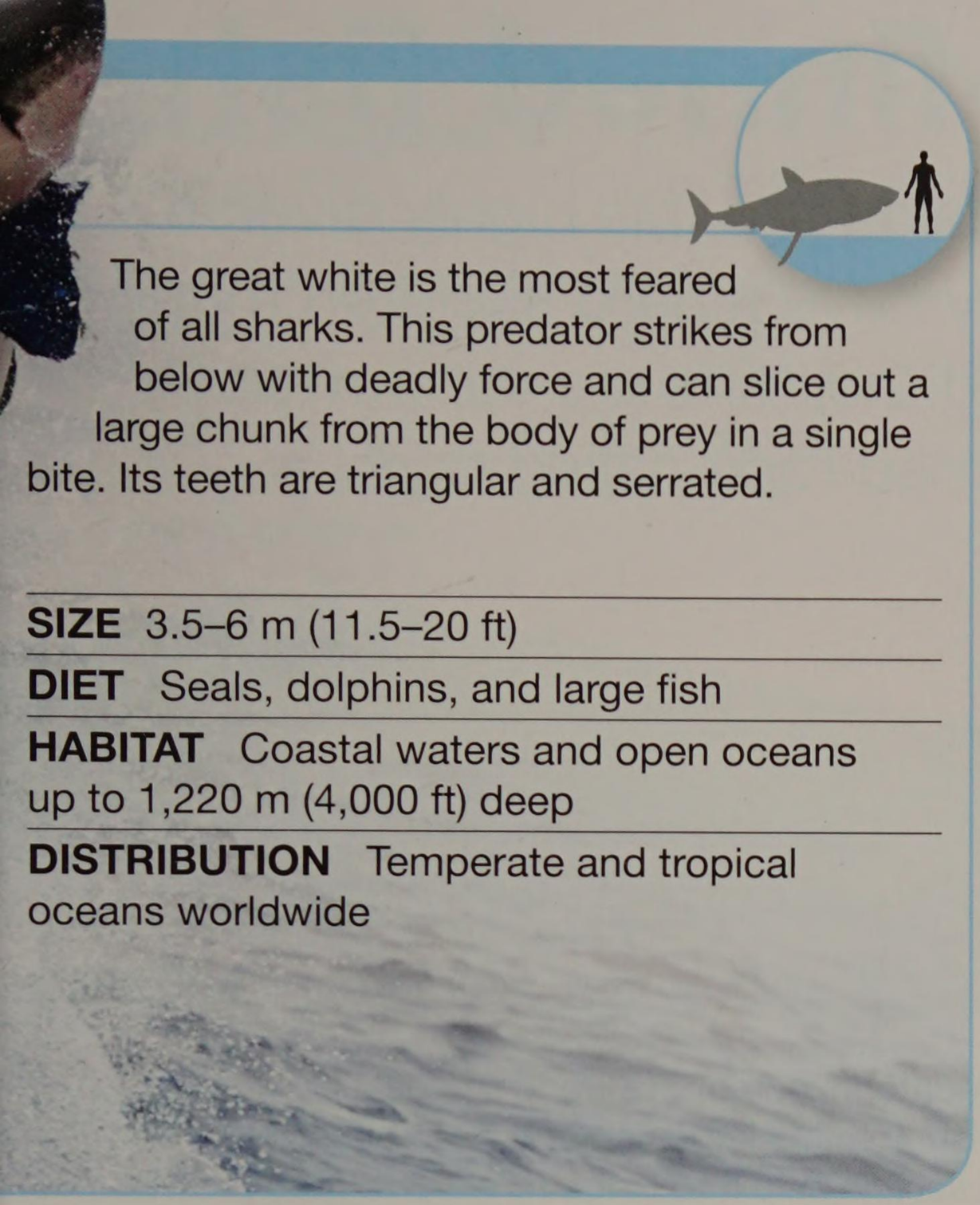
SIZE 7–9.8 m (23–32.2 ft)

DIET Plankton

HABITAT Open oceans, diving up to 1,265 m (4,150 ft) deep

DISTRIBUTION West and east Atlantic Ocean, Indian Ocean, and west and east Pacific Ocean

Very large gill slits



The great white is the most feared of all sharks. This predator strikes from below with deadly force and can slice out a large chunk from the body of prey in a single bite. Its teeth are triangular and serrated.

SIZE 3.5–6 m (11.5–20 ft)

DIET Seals, dolphins, and large fish

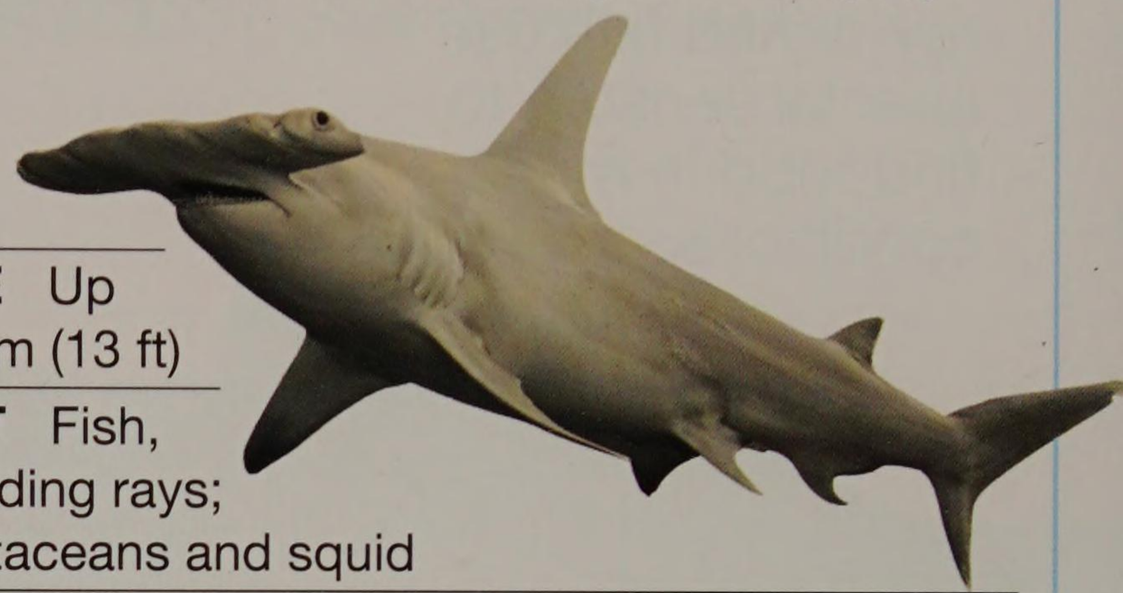
HABITAT Coastal waters and open oceans up to 1,220 m (4,000 ft) deep

DISTRIBUTION Temperate and tropical oceans worldwide

Smooth hammerhead shark

Sphyrna zygaena

This formidable hunter moves its head in a constant sweeping motion when hunting. Like other sharks, it uses tiny sense organs on its snout to detect electrical signals from prey.



SIZE Up to 4 m (13 ft)

DIET Fish, including rays; crustaceans and squid

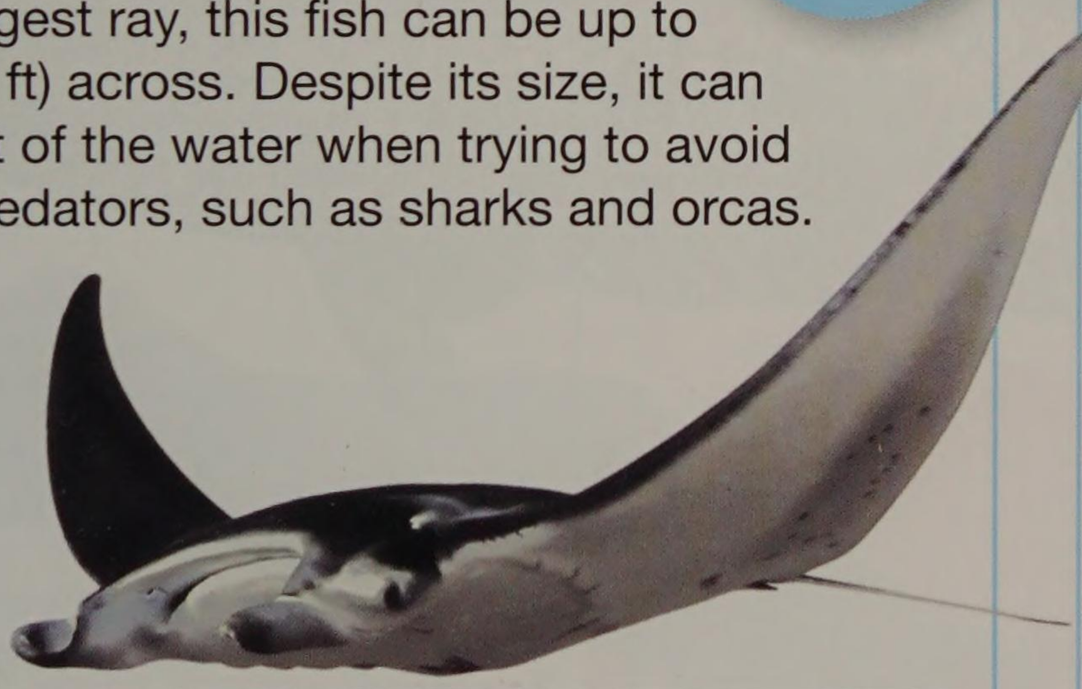
HABITAT Coastal waters up to 20 m (66 ft) deep

DISTRIBUTION Temperate and tropical oceans worldwide

Giant manta ray

Manta birostris

The biggest ray, this fish can be up to 9 m (30 ft) across. Despite its size, it can leap out of the water when trying to avoid large predators, such as sharks and orcas.



SIZE 4.5–9 m (14.5–30 ft) across

DIET Plankton

HABITAT Near rocky coral reefs up to 120 m (390 ft) deep

DISTRIBUTION Tropical and warm temperate waters

Blue-spotted ribbontail ray

Taeniura lymma

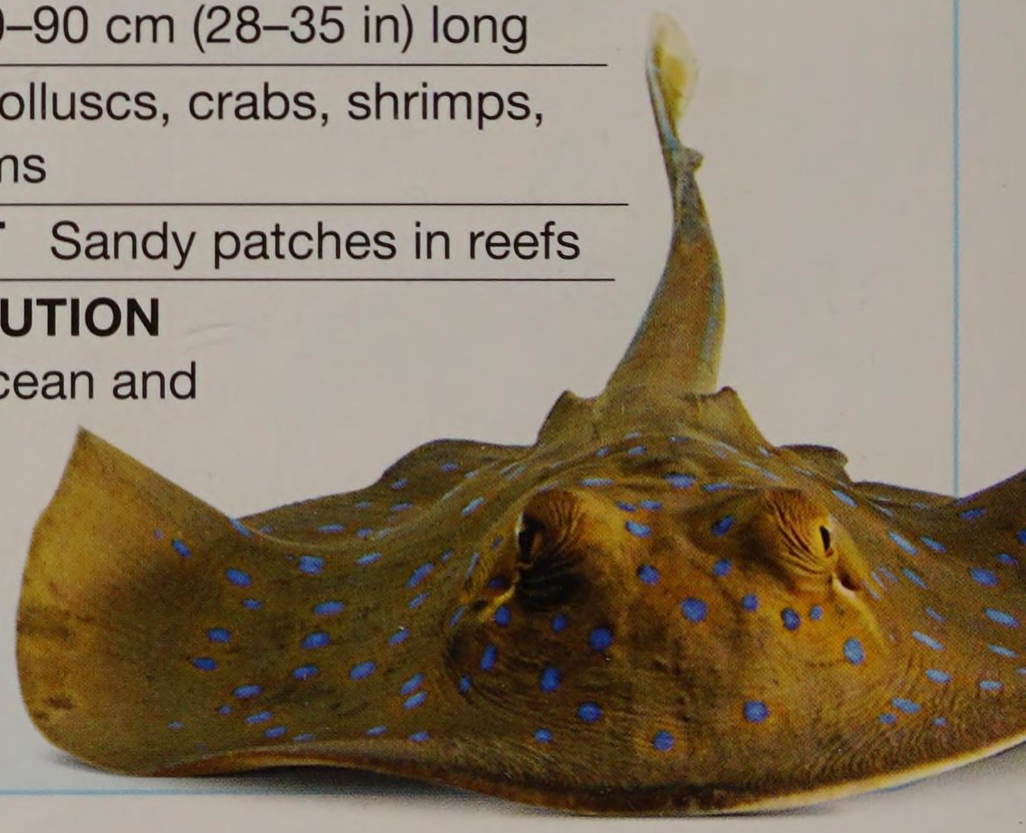
Blue-spotted ribbontail rays often bury themselves in the sand on the sea bed, with only their eyes exposed, for safety. This also camouflages them from prey as they lie in wait.

SIZE 70–90 cm (28–35 in) long

DIET Molluscs, crabs, shrimps, and worms

HABITAT Sandy patches in reefs

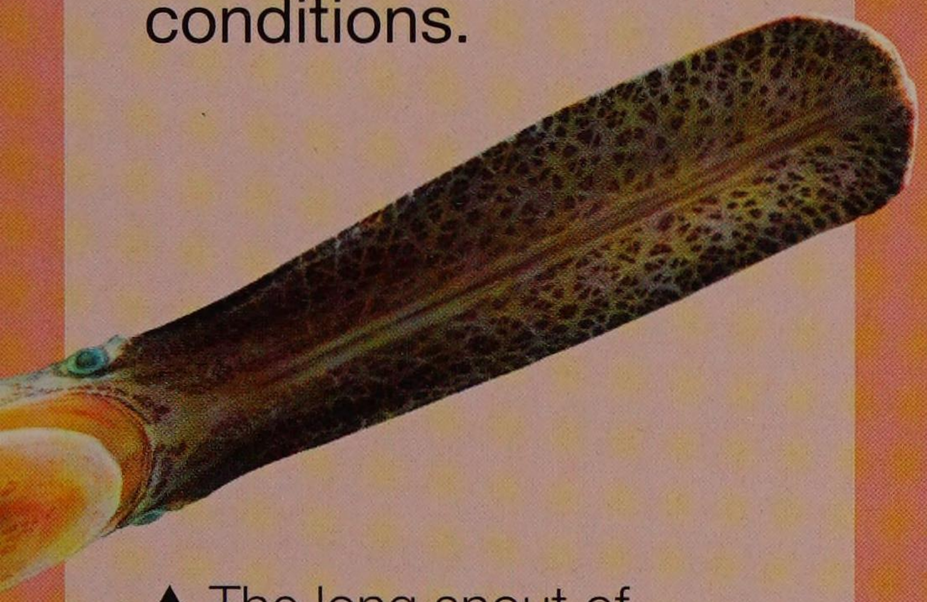
DISTRIBUTION Indian Ocean and western Pacific Ocean



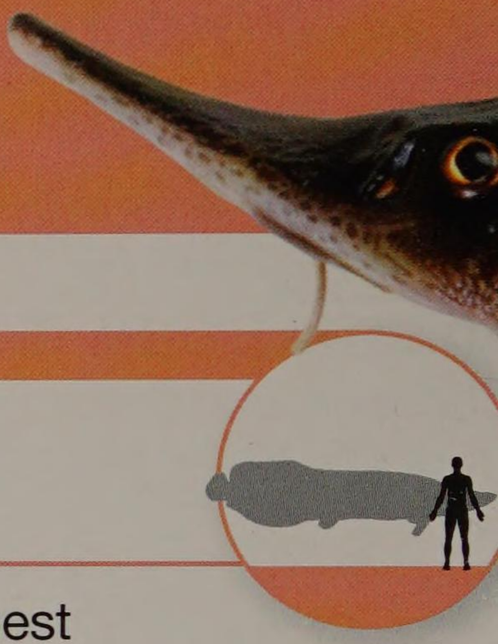
Ray-finned fish

Most fish belong to this highly diverse group. They have a hard skeleton made of bone and their fins are supported by a fan of jointed rods called rays.

FOCUS ON...
SENSES
Many freshwater ray-finned fish use special sensors to find food in murky conditions.



▲ The long snout of a paddlefish contains receptors that detect electrical signals from prey.



Arapaima
Arapaima gigas

This river predator is one of the world's largest freshwater fish. It hunts large fish and even birds. Its powerful tail fins help it to lunge forward to grab prey. It breathes air through its swim bladder, which through evolution has grown and adapted to become a simple lung.

Grey to green body

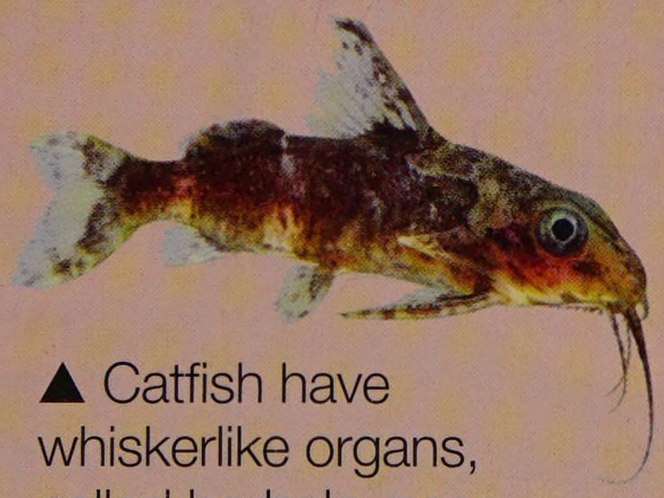
The arapaima is as heavy as 3 cows – an amazing 200 kg (441 lb).

SIZE Up to 4.5 m (14.75 ft) long

DIET Fish and crustaceans

HABITAT Rivers

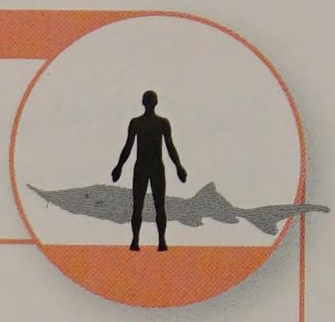
DISTRIBUTION
South America



▲ Catfish have whiskerlike organs, called barbels, near the mouth, which they use to find food.

European sturgeon
Acipenser sturio

ENDANGERED



This fish lives in the sea, but in the breeding season it may travel as far as 1,000 km (620 miles) up the river where it was born. The demand for caviar – made from the eggs of the sturgeon – has brought this fish to the brink of extinction.

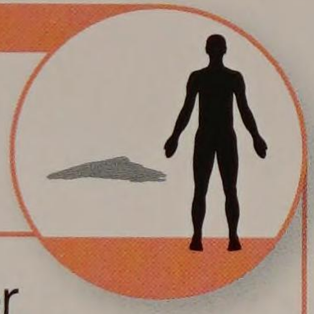
SIZE Up to 3.5 m (11.5 ft) long

DIET Marine worms, shrimp, and fish

HABITAT Coastal waters and rivers

DISTRIBUTION River Gironde, France

Jewel moray eel
Muraena lentiginosa



Moray eels feed in a unique way. After their front teeth seize prey, a second set of jaws in their throat comes forward, grips the prey and pulls it down the throat.

Spotted skin helps it hide

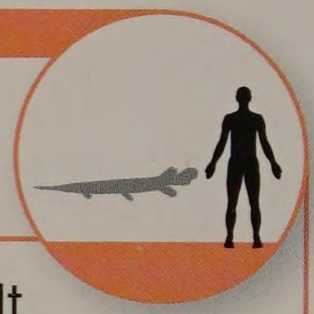
SIZE 60 cm (23.5 in) long

DIET Crustaceans and fish

HABITAT Coral reefs

DISTRIBUTION Eastern Pacific Ocean

Longnose gar
Lepisosteus osseus



The longnose gar is a stealth hunter. It hangs motionless in the water, hidden by aquatic plants. Then with a sudden thrust, it attacks unsuspecting prey. Long jaws armed with needle-like teeth grip the struggling prey.

SIZE 1.8 m (6 ft) long

DIET Mainly fish

HABITAT Seas and wetlands

DISTRIBUTION Central and eastern North America

Diamond-shaped scales

Sargassum fish

Histrio histrio

Spotted skin helps this fish to blend in with its surroundings

Leglike pectoral fin can be used for walking on sea bed

The sargassum fish can swallow prey as large as itself.

This fish has a good camouflage – it blends in well with the drifting sargassum weeds in which it lives. When hunting, the sargassum fish uses a spine on its back to lure prey. Males violently nip and chase females during courtship.

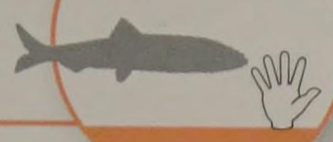
SIZE 20 cm (8 in) long

DIET Mainly crustaceans and fish

HABITAT Floating beds of sargassum seaweed, open ocean surface waters

DISTRIBUTION Tropical and subtropical seas worldwide

Atlantic herring
Clupea harengus



Small plankton-eating fish of the open ocean, such as this one, feed by swimming into the current with their mouth open. This herring moves to deeper waters in the day.

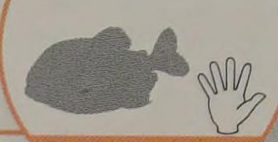
SIZE 45 cm (18 in) long

DIET Plankton

HABITAT Open oceans

DISTRIBUTION Northeastern Atlantic Ocean, North Sea, and Baltic Sea

Red piranha
Pygocentrus nattereri



Red piranhas have a fearsome reputation. They usually hunt on their own, but when hunting in groups, they can attack and kill larger animals, such as the capybara.

SIZE 33 cm (13 in) long

DIET Fish and insects

HABITAT Rivers

DISTRIBUTION North, central, and eastern South America

John Dory
Zeus faber

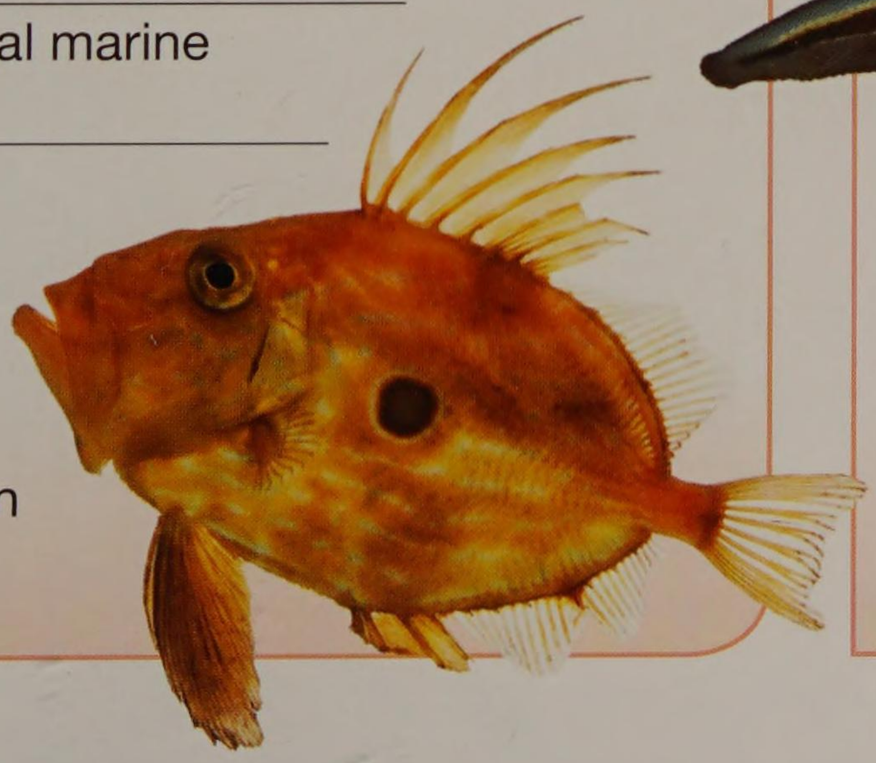
This fish has a disc-shaped body, which makes it difficult to spot from front or behind. When hunting, it can extend its jaw quickly to capture small fish.

SIZE 90 cm (35 in) long

DIET Small fish

HABITAT Coastal marine waters

DISTRIBUTION Eastern Atlantic, Mediterranean Sea, Black Sea, Indian Ocean, and Pacific Ocean



Striped eel catfish
Plotosus lineatus

Many catfish live in freshwater habitats, but this is the only marine species and is found on coral reefs. A very alert fish, it defends itself with a trio of poisonous spines.

SIZE 32 cm (13 in) long

DIET Mainly invertebrates, such as oysters and sponges, and fish

HABITAT Reefs, estuaries, and sea grass beds

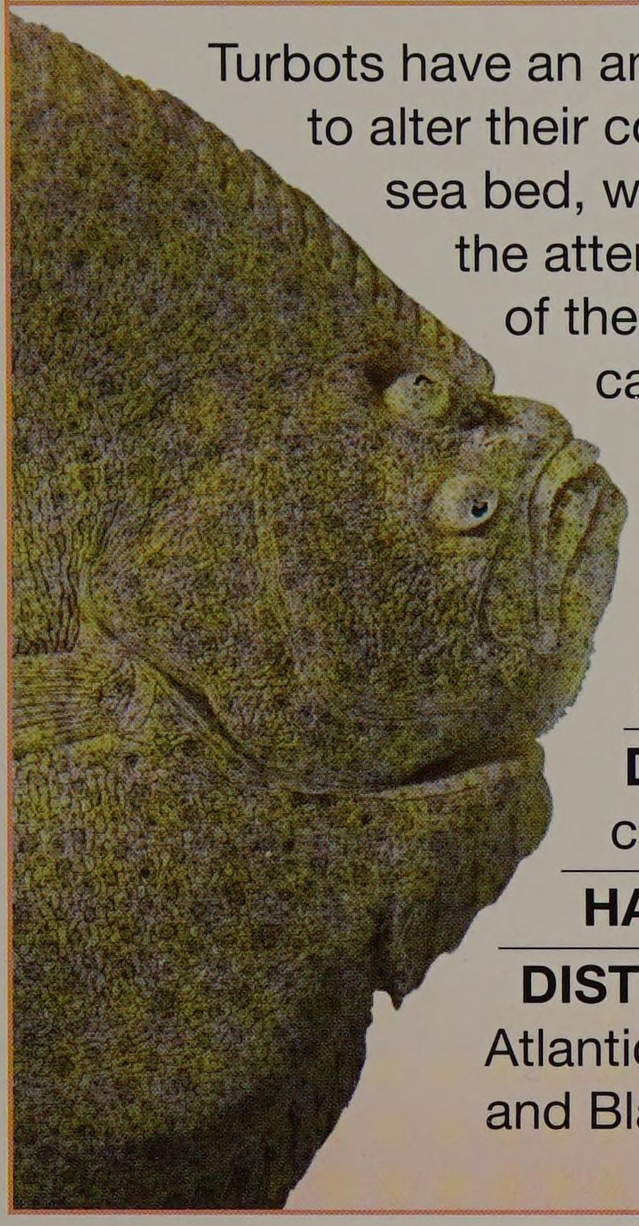
DISTRIBUTION Indian Ocean, western Pacific

LIONFISH

This fish hunts at night and moves to deeper water to find prey. It relies on camouflage and lightning-fast reflexes to hunt its prey – mainly fish and shrimp. It can also sweep up and trap prey with its extended pectoral fins.


The lionfish
can expand its
stomach more than
30 times
its original size
to take in large
amounts of food

Turbot
Psetta maxima



Turbots have an amazing ability to alter their colour to match the sea bed, which helps them avoid the attention of predators most of the time. Female turbots can lay as many as 15 million eggs.

SIZE 1 m (3.3 ft) long

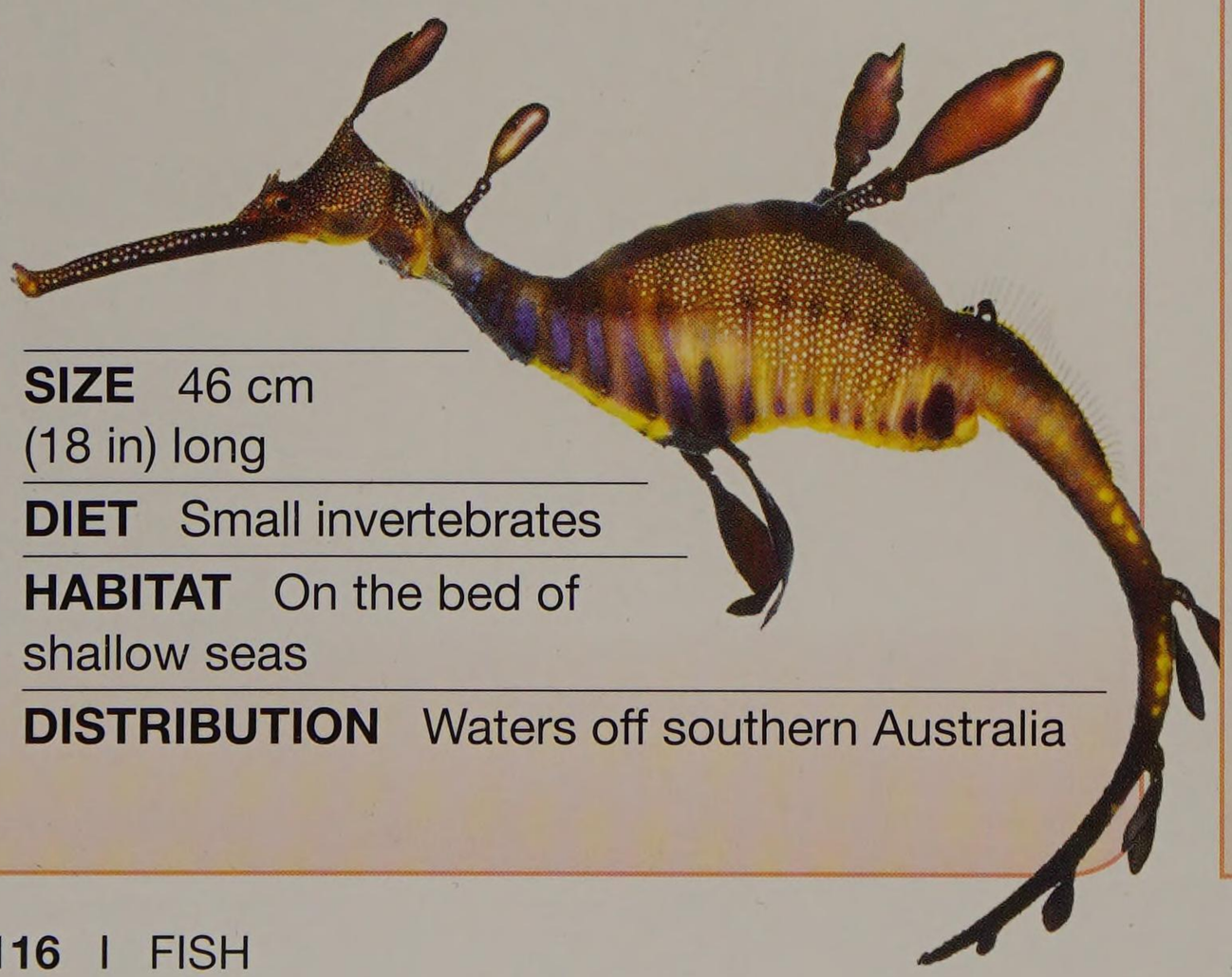
DIET Fish and crustaceans

HABITAT Sea bed

DISTRIBUTION Northern Atlantic, Mediterranean Sea, and Black Sea

Weedy seadragon
Phyllopteryx taeniolatus

Seahorses have tough body coverings that make them stiff. This is one of the largest seahorses. It has bizarre "leaves" all over that help it hide in its seaweed home.



SIZE 46 cm (18 in) long

DIET Small invertebrates

HABITAT On the bed of shallow seas

DISTRIBUTION Waters off southern Australia

Red lionfish
Pterois volitans

The spines of a red lionfish are venomous and can deliver a very painful but rarely fatal sting.

Fleshy "whiskers" help hide its large, open mouth when approaching prey

The red lionfish is a menacing hunter. It stalks prey and corners its victim by spreading out its wide fins on each side, then snapping up prey with lightning speed. It usually floats slightly head down in water, ready to pounce on prey.

Altantic mudskipper
Periophthalmus barbarus

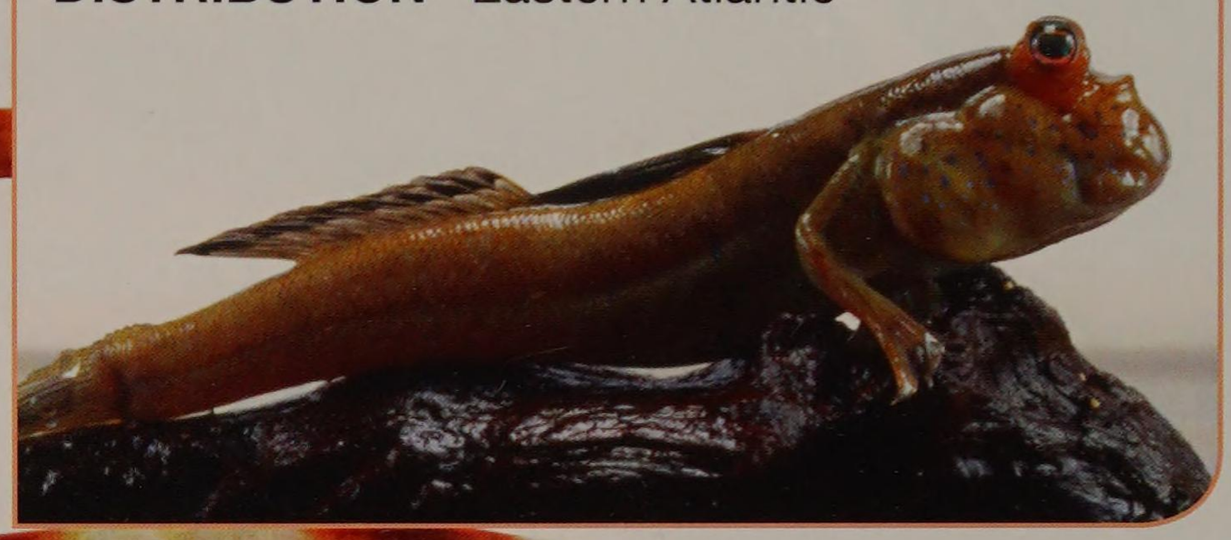
This fish can survive out of water by absorbing oxygen from the air through its skin. At low tide, it skips over mudflats using its front pair of fins as legs.

SIZE 25 cm (10 in) long

DIET Small animals on the mud surface

HABITAT Mangroves and other tidal mudflats

DISTRIBUTION Eastern Atlantic



Clown anemonefish
Amphiprion ocellaris

The colourful clown anemonefish cleans algae off its host – the giant sea anemone. A special slime on its skin protects the fish from its host's sting.

SIZE 11 cm (4.5 in) long

DIET Algae and fish leftovers from sea anemone

HABITAT Waters near coral reefs

DISTRIBUTION Western Pacific Ocean

Invertebrates

Invertebrates were the first animals to evolve on Earth. Today, they make up almost 97 per cent of all animal life and range from simple animals, such as sponges, to animals with large brains and complex networks of nerves, such as squid and octopus. What they all have in common is the lack of a backbone. Other invertebrates include corals, worms, snails, starfish, and the most numerous of all, insects.

FLASHING LIGHT
This bobtail squid flashes light from photophores (special organs containing light-emitting bacteria) for disguise and communication.

Invertebrates

Invertebrates make up the majority of animals on Earth. They form many separate groups and exhibit an extraordinary variety of shapes and sizes – from corals attached to the sea bed to the winged insects, which were the first kind of animal to evolve powered flight.

Types of invertebrate

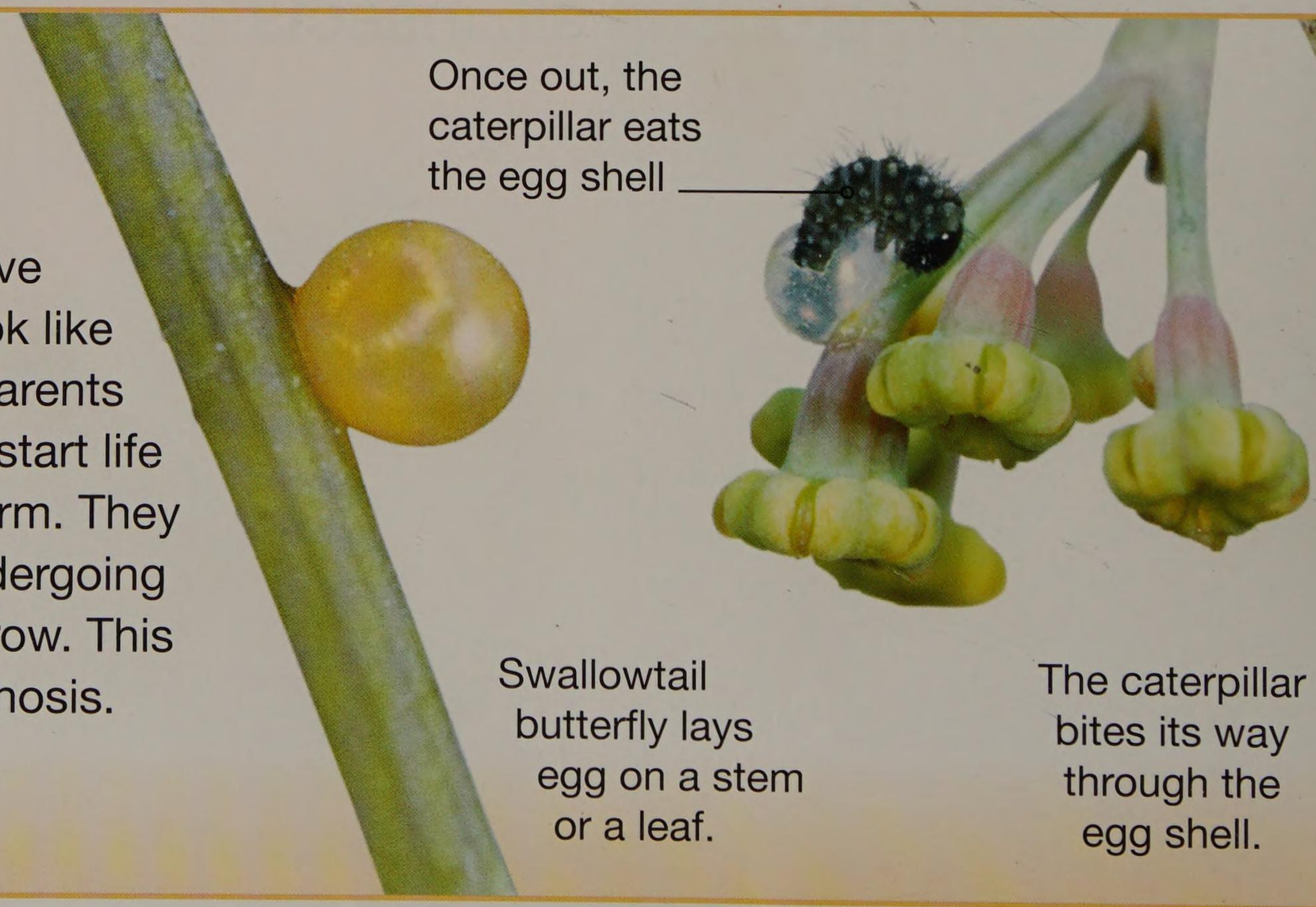
Invertebrates are highly varied and rather than forming a single natural group, they belong to many different groups. They range from simple-bodied sponges to predators such as squid.

Sea urchins have a spherical skeleton covered by movable spines, which help them move.

Cuttlefish have two long tentacles with which they catch prey.

Life cycle

Most invertebrates have separate larval and adult stages and often look and live entirely differently. Some look like miniature versions of their parents when they hatch, but many start life with a very different body form. They start their life as an egg, undergoing changes in shape as they grow. This process is called metamorphosis.



Swallowtail butterfly lays egg on a stem or a leaf.

The caterpillar bites its way through the egg shell.

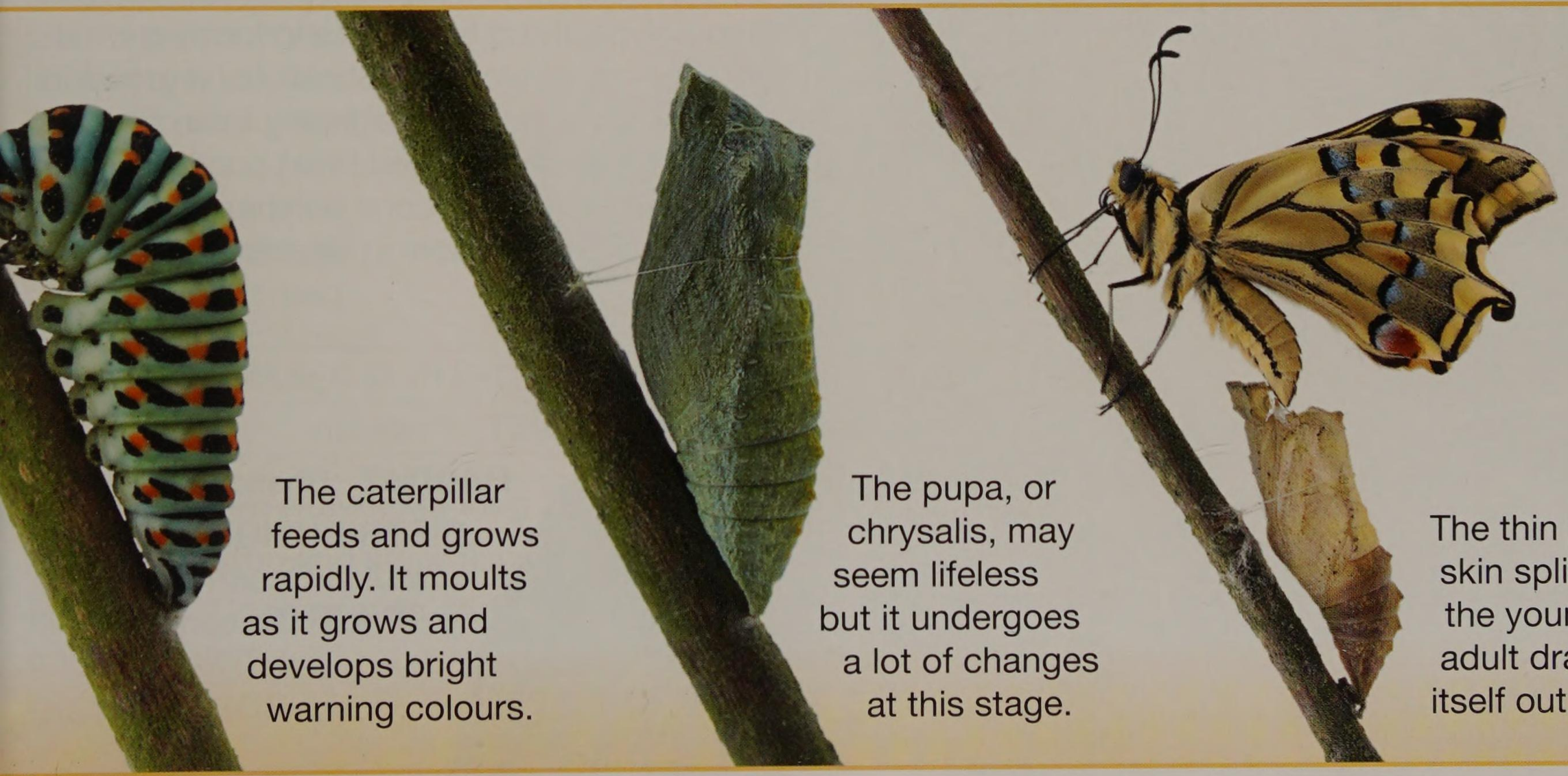
REPRODUCTION

Some invertebrates, including aphids in summer, can reproduce asexually. One organism gives rise to many offspring that are exact copies of it.

Most invertebrates, including damselflies, reproduce sexually. Females mate with males to produce offspring that inherit features from both parents.

Living in groups

Many invertebrates live in groups called colonies, including corals and insects, such as bees and termites. Insect colonies are often devoted to a single breeding female – the queen. Most members are workers that perform different duties.



The caterpillar feeds and grows rapidly. It moults as it grows and develops bright warning colours.

The pupa, or chrysalis, may seem lifeless but it undergoes a lot of changes at this stage.

The thin pupal skin splits and the young adult draws itself out.

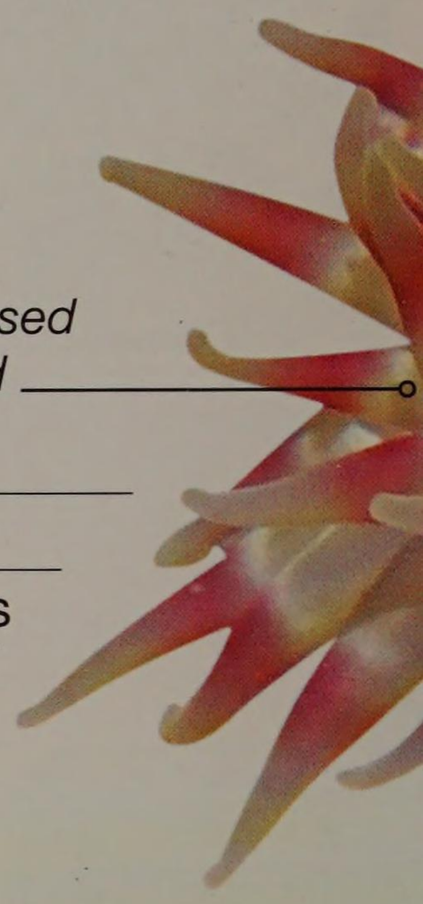
Sponges, corals, and jellyfish

Sponges are fixed to the sea bed as adults, as are corals. Their larvae are mobile, as are those of jellyfish. All of these have a single body opening and food and waste pass through it.

Dahlia anemone
Urticina felina

Sea anemones look like flowers but are actually animals. The dahlia anemone has sticky swellings on the sides of its body and the sand sticks to them. This camouflages the anemone when it retracts its tentacles, making it look like a pile of gravel.

Tentacles used to trap food

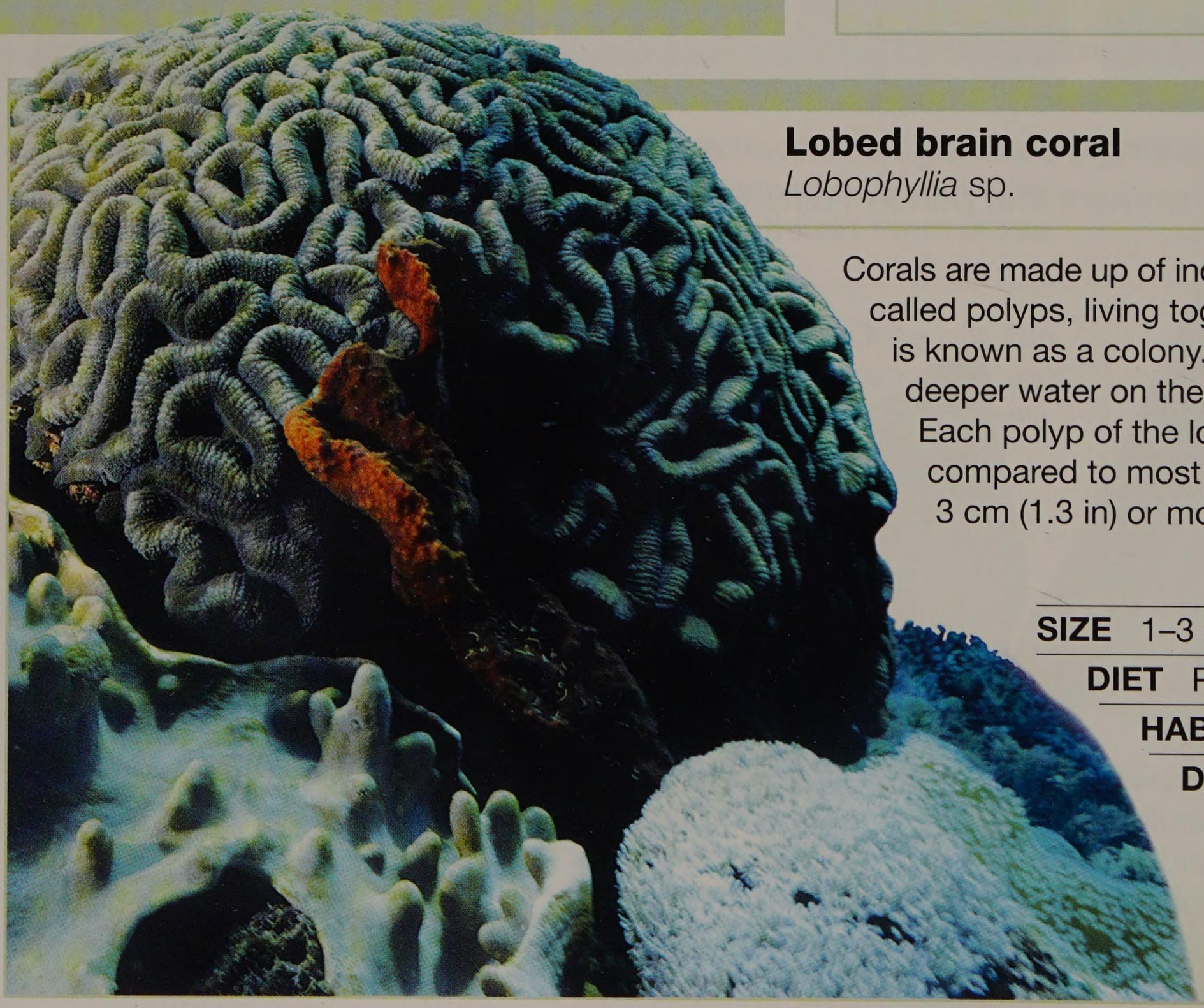


SIZE 10–12 cm (4–4.75 in) long

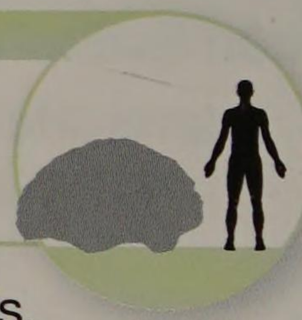
DIET Small fish and crustaceans

HABITAT Shallow ocean floor

DISTRIBUTION Arctic Ocean



Lobed brain coral
Lobophyllia sp.



Corals are made up of individual animals, called polyps, living together and forming what is known as a colony. The brain coral grows in deeper water on the sea-facing side of reefs. Each polyp of the lobed brain coral is large compared to most coral polyps – about 3 cm (1.3 in) or more in diameter.

SIZE 1–3 m (3.3–9.75 ft) long

DIET Plankton

HABITAT Shallow sea bed

DISTRIBUTION Indian Ocean and Pacific Ocean

Stove-pipe sponge
Aplysina archeri

Sponges spend their adult lives fixed to one place. They pump water in through small holes in their sides and out through the large opening at the top, filtering out tiny food particles from the current.

SIZE 0.8–2 m (2.5–6.5 ft) tall

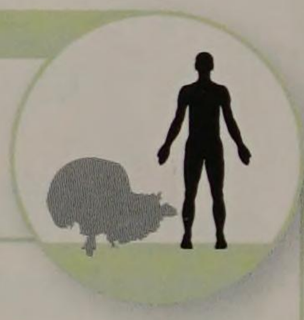
DIET Plankton

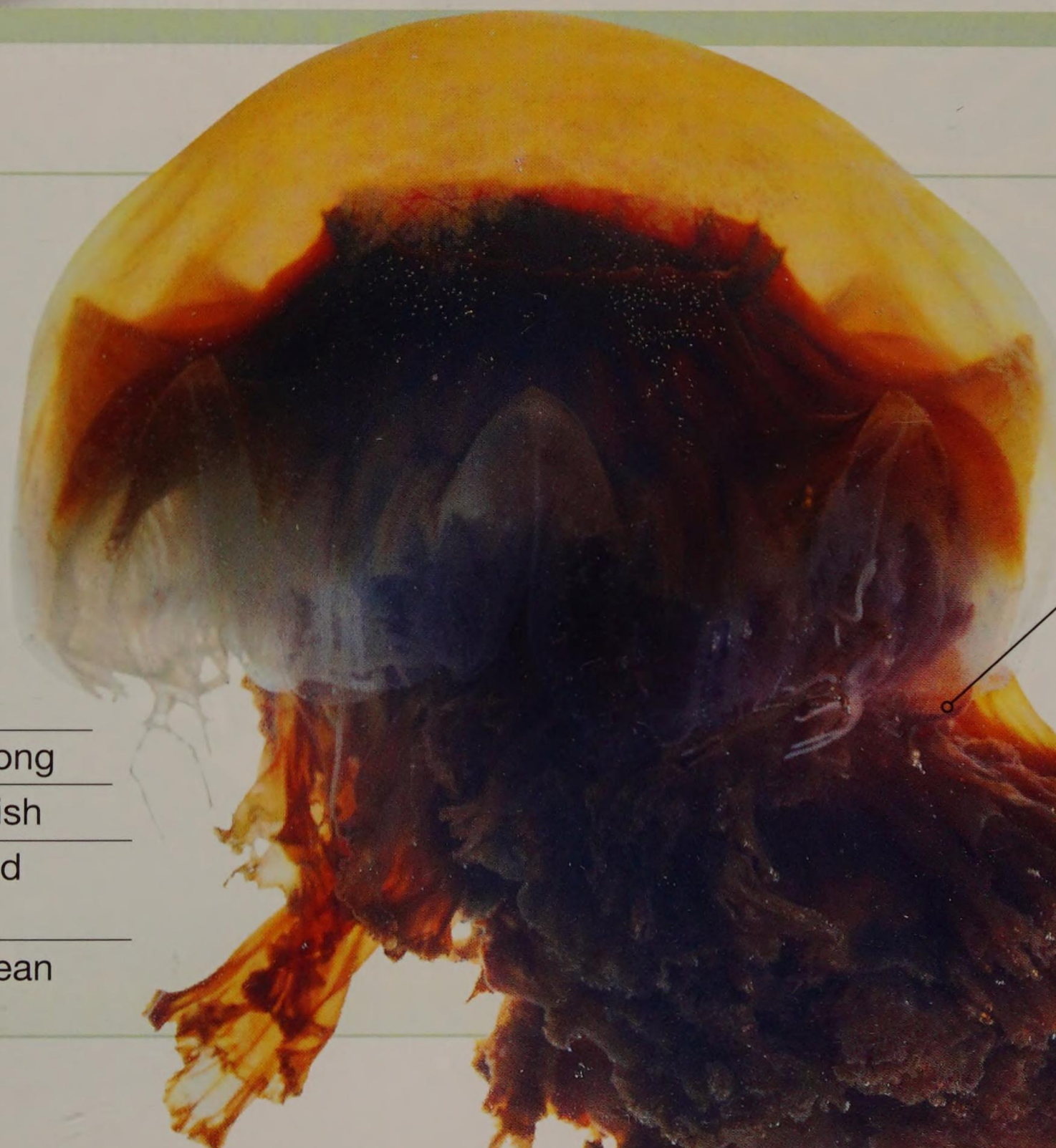
HABITAT Tropical reefs

DISTRIBUTION Caribbean Sea

Lion's mane jellyfish
Cyanea capillata

Most jellyfish are harmless but some, such as the lion's mane jellyfish, can deliver a painful sting. Its numerous long tentacles act like fishing lines in catching food. Its translucent, domed bell opens and closes like a big umbrella.





Tentacles arranged in dense groups

SIZE 0.5–2 m (1.5–6.5 ft) long

DIET Plankton and small fish

HABITAT Open oceans and coastal waters

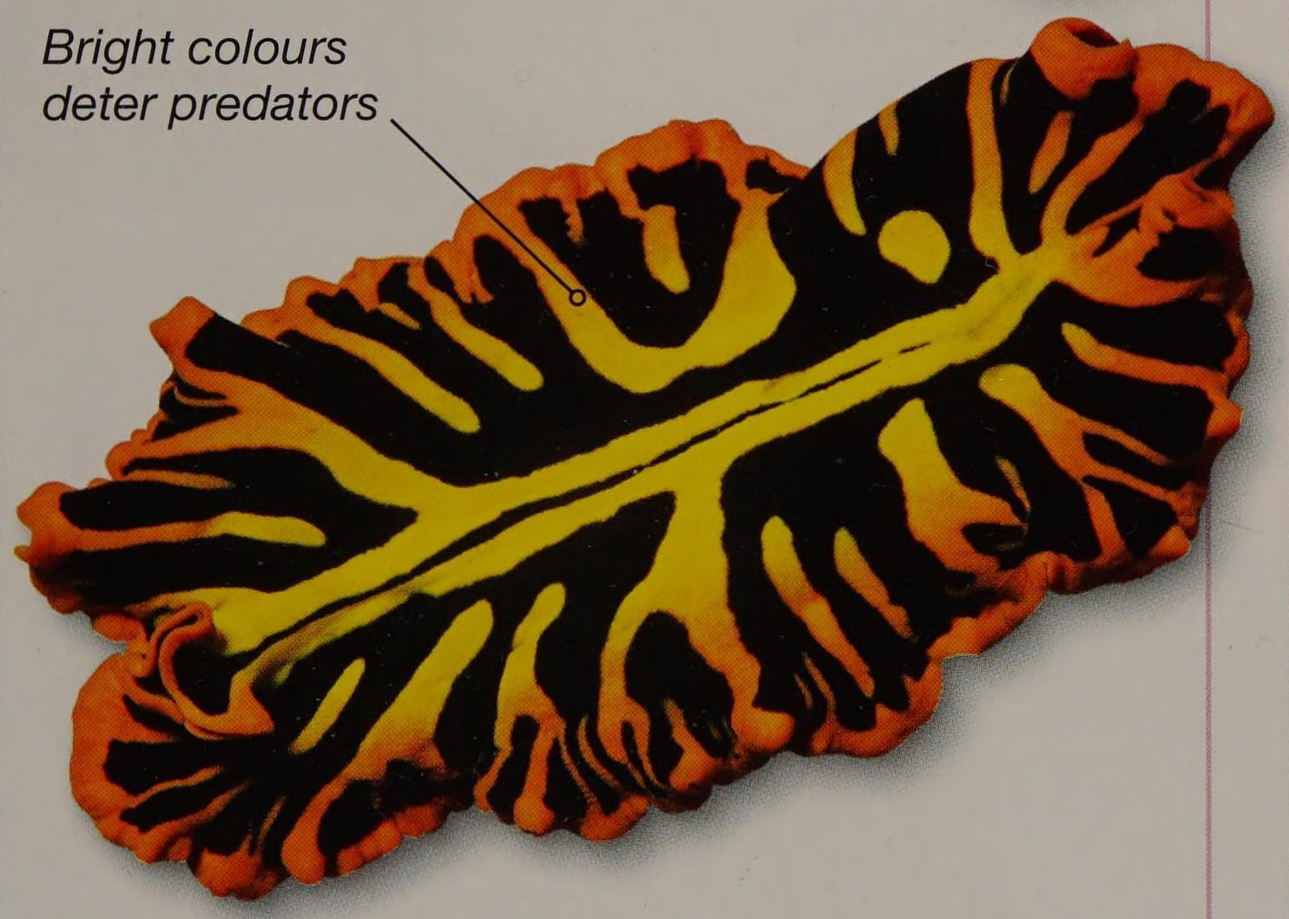
DISTRIBUTION Arctic Ocean

Worms

Countless types of worm live in many different habitats – in burrows, in the soil, in the sea, and as parasites inside bigger animals. The major groups of worm include the roundworms, segmented worms, and flatworms.

FOCUS ON...
DIVERSITY
Worms are the most abundant animals on Earth and they come in many shapes and sizes

Black and yellow flatworm
Pseudoceros dimidiatus



Among flatworms there are many parasites, but the sea-living black and yellow flatworm is free-living. It swims by rippling its paper-thin body, which helps it absorb oxygen from water.

SIZE	7–7.6 cm (2.75–3 in) long
DIET	Decaying plant and animal matter
HABITAT	Coral reefs
DISTRIBUTION	Indian Ocean and Pacific Ocean

Christmas tree tube worm
Spirobranchus giganteus

The Christmas tree tube worm is named after its extravagant whorls of tentacles, which it uses to filter food and take in oxygen. Most of its body is hidden within a tube into which it can withdraw entirely if threatened. It then covers the top of the tube with a hatch like a snail's.

▲ This ribbon worm lives on the sea bed, but some live in fresh water or on land.

▲ Velvet worms have many pairs of stubby "legs" and attack insect prey by spraying it with slimy mucus.

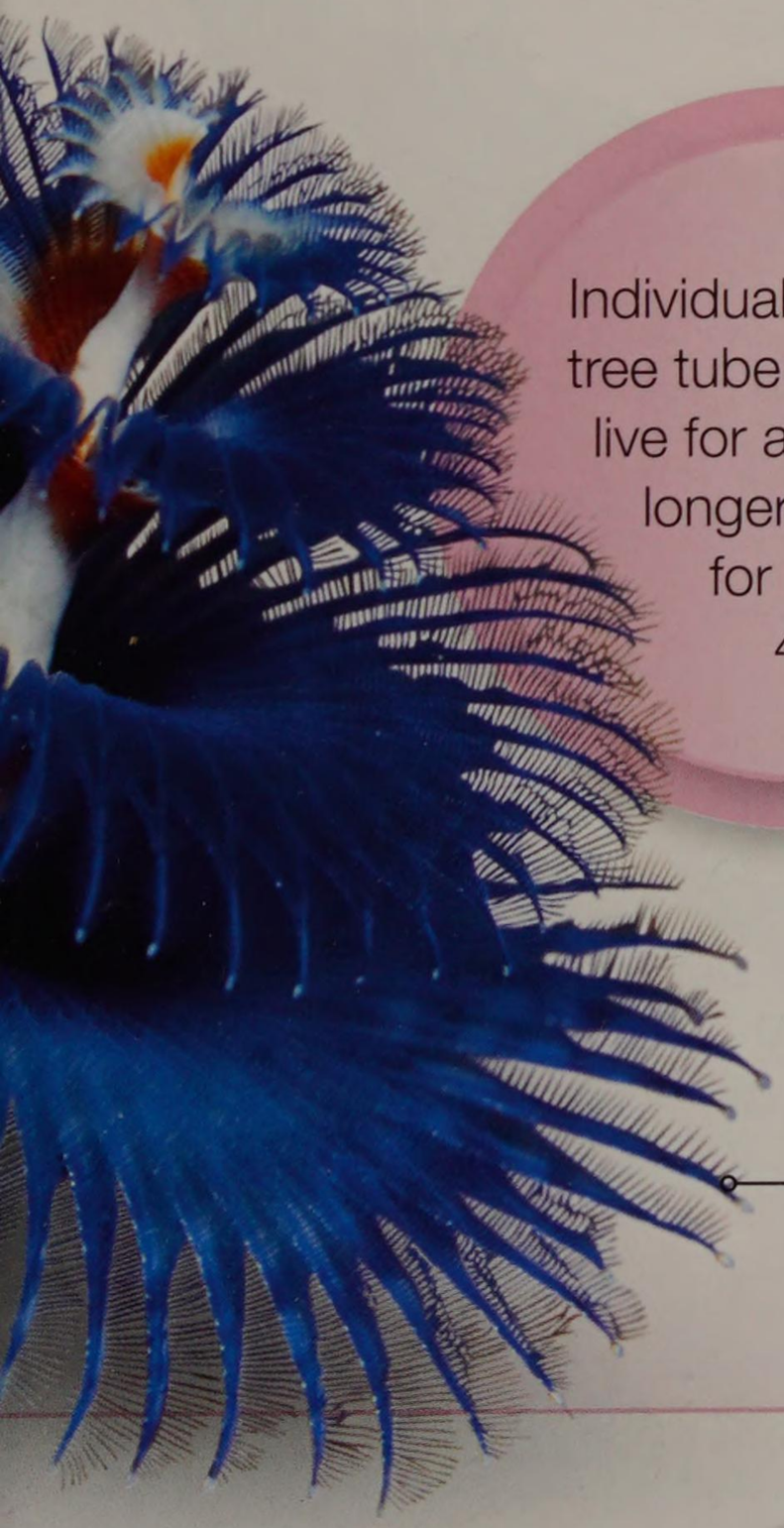
▲ Horseshoe worms are marine animals with as many as 15,000 feeding tentacles.

SIZE 4–7 cm (1.5–2.75 in) long

DIET Plankton

HABITAT Tropical reefs

DISTRIBUTION Caribbean



Individual Christmas tree tube worms may live for a decade or longer. Some live for more than 40 years.

Whorls of feeding tentacles

Large intestinal roundworm

Ascaris sp.

This parasite enters the human host when the person eats food contaminated with its eggs. The larvae travel to the lungs through the blood, moving to the intestine as adults. The female produces millions of eggs, which pass out of the host in the faeces.

SIZE 15–35 cm (6–14 in) long

DIET Nutrients from host's digested food; blood

HABITAT Host body

DISTRIBUTION Tropical and subtropical regions

Molluscs

This group of invertebrates includes the slugs, snails, oysters, clams, octopuses, squid, and cuttlefish. Most molluscs have a soft body and a muscular base called a foot. Many have protective shells and feed using a moving ribbon of teeth called radula.

FOCUS ON...
SHELLS
Mollusc shells contain a mineral called calcium carbonate.

Land snail

▲ Gastropods are molluscs with a single shell. Most use their muscular foot to crawl.

Clam

▲ Bivalves have a shell with two halves, or valves. Powerful muscles pull and hold the shells closed.

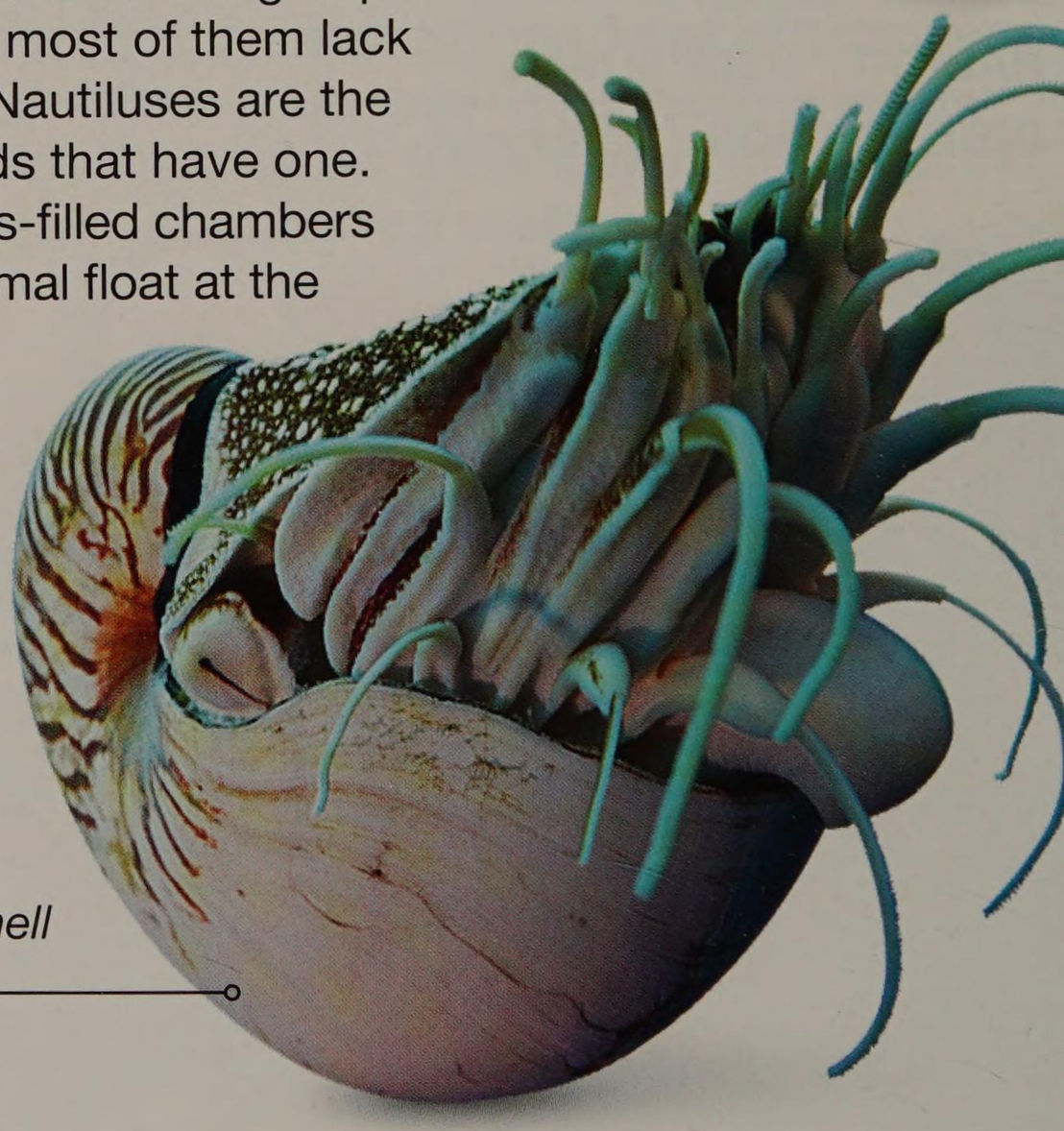
Octopus

▲ Shells of cephalopods, such as squid, are inside their body. Octopuses, however, lack shells.

Chambered nautilus

Nautilus pompilius

The cephalopods form one group of molluscs and most of them lack external shells. Nautiluses are the only cephalopods that have one. The shell has gas-filled chambers that help the animal float at the right depth. The chambered nautilus has about 90 tentacles that lack suckers.



SIZE 15–24 cm (6–9.5 in) long

DIET Small fish, shrimp, and other crustaceans

HABITAT Slopes beneath coral reefs up to 600 m (2,000 ft) deep

DISTRIBUTION Indian Ocean and Pacific Ocean

Marbled chiton
Chiton marmoratus

Chitons are not cephalopods. They form another group of molluscs with shells made up of a series of plates. The plates are made up of a chalky mineral called aragonite.

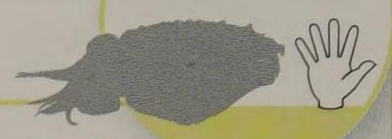
SIZE 8 cm (3.25 in) long

DIET Algae and microbe films on rocks

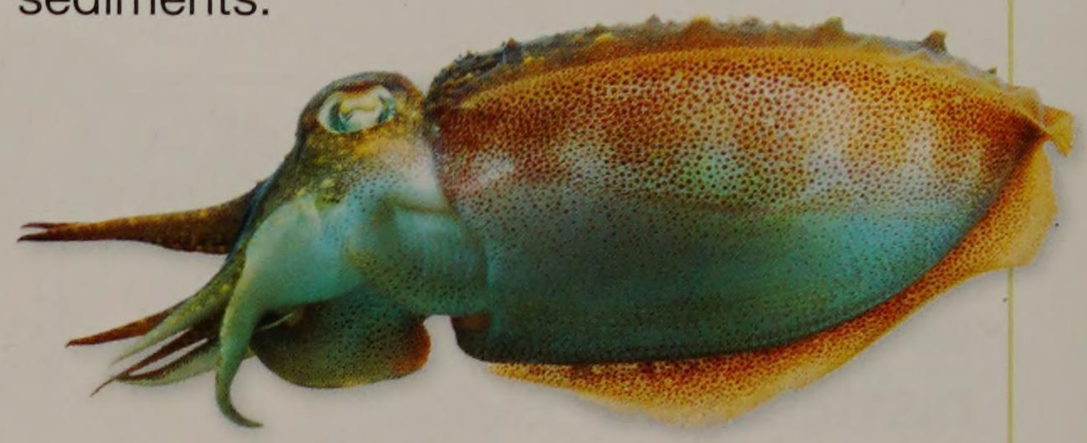
HABITAT Rocks in coastal waters

DISTRIBUTION Caribbean

Common cuttlefish
Sepia officinalis



This cuttlefish rests on the sea bed but swims when hunting, moving by forcing a jet of water out of its body. The common cuttlefish migrates inshore to lay eggs on muddy sediments.



SIZE 40–50 cm (16–20 in) long

DIET Molluscs, shrimp, and other crustaceans

HABITAT Coastal waters

DISTRIBUTION Seas off Europe and South Africa

Common octopus
Octopus vulgaris

The common octopus is one of the most intelligent invertebrates. It has excellent vision, eight muscular arms, and a horny beak. It is short-lived, however, surviving for only about 2 years.

SIZE 1.5–3 m (5–10 ft) tentacle span

DIET Crustaceans and shelled molluscs

HABITAT Rocky coastal waters

DISTRIBUTION Tropical and warm temperate regions

Tough skin can change colour

Giant African land snail

Achatina fulica

This is the largest land-dwelling snail. When introduced anywhere, its numbers increase and it becomes a pest. Like many gastropods, it is both male and female at the same time.

SIZE 15–22 cm (6–9 in) long

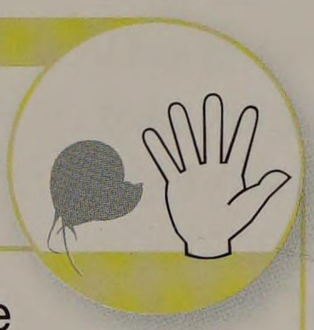
DIET Plants, fruits, and vegetables

HABITAT Coastlands, forests, wetlands, and urban areas

DISTRIBUTION East Africa

Channelled apple snail

Pomacea canaliculata



The voracious appetite of the channelled apple snail has made it an agricultural pest in rice-farming areas. It is a freshwater species with gills that can function as lungs so it can survive for periods out of water.

SIZE 10–15 cm (4–6 in) long

DIET Grass, animal matter, and decaying matter

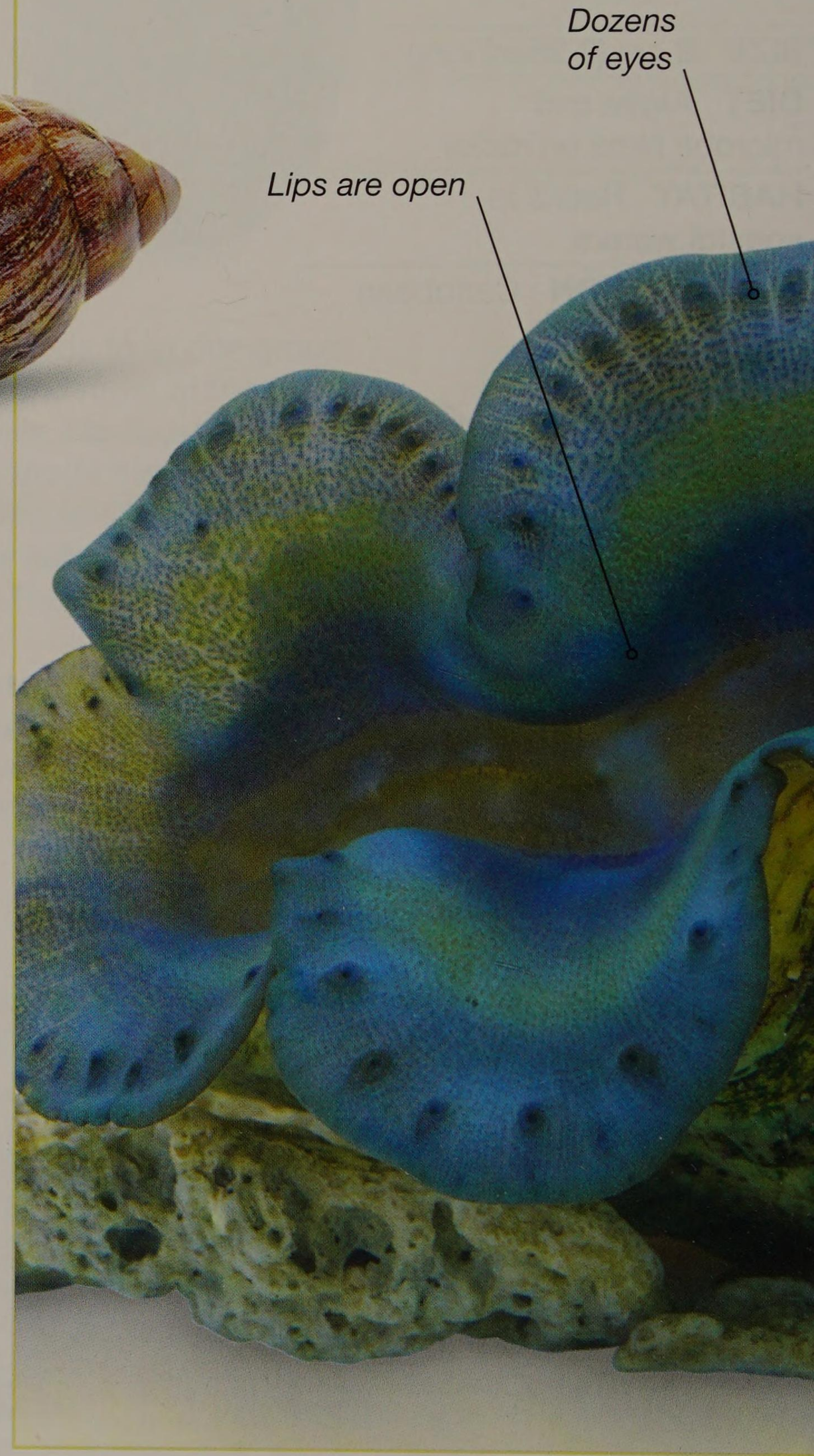
HABITAT Freshwater habitats, such as ponds and lakes

DISTRIBUTION Tropical Americas

Giant clam

Tridacna gigas

The giant clam is the world's biggest bivalve. It opens up in the day exposing its fleshy lips that contain millions of algae. Sunlight helps the algae make their own food by photosynthesis, and some of this food is used by the clam. The clam is also a filter feeder.



SIZE 1–1.4 m (3.25–4.5 ft) long

DIET Sugars made by algae and particles of food floating nearby

HABITAT Sea bed

DISTRIBUTION Indian Ocean and Pacific Ocean

The amazing colour of the giant clam comes from the algae that find a safe haven in its flesh.

Water flows through siphons, creating a current for feeding and absorbing oxygen

Great scallop

Pecten maximus

Like all scallops, the great scallop rests on the sea bed, with its shells slightly open. If disturbed, it clamps down its shells, squirting a jet of water that pushes it along.

SIZE 12–15 cm (4.75–6 in) long

DIET Plankton

HABITAT Fine sandy sea bed

DISTRIBUTION Off European coasts

Sunburst carrier shell

Stellaria solaris

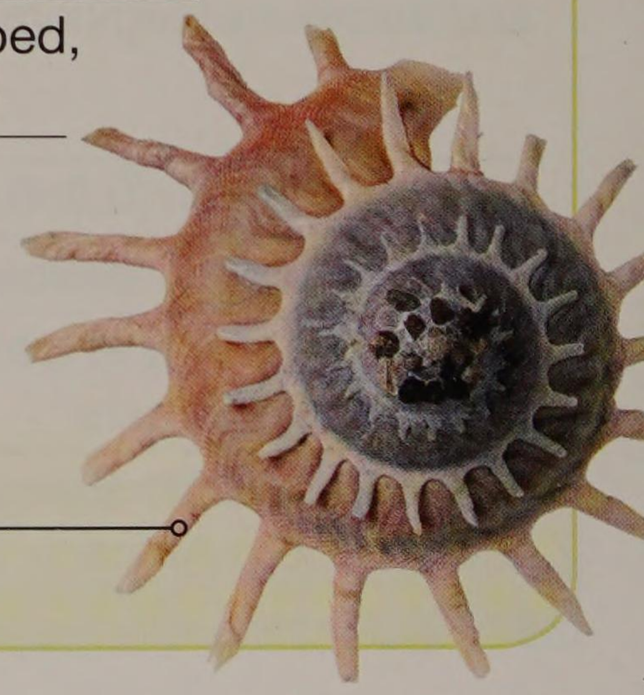
This sea snail often cements pebbles or shells of other snails and clams on to its own for protection. Its spines help raise the shell up off the ocean floor.

SIZE Up to 13 cm (5 in) long

DIET Algae

HABITAT Near the sea bed, up to 250 m (820 ft) deep

DISTRIBUTION Indian Ocean, Red Sea, and Pacific Ocean



Spikes may break when older

Arthropods

Four out of five animal species are arthropods. They form by far the largest group of invertebrates. They include insects, spiders, and crabs, all of which have a tough outer covering, or exoskeleton.

FOCUS ON...
APPENDAGES
Arthropod means "jointed legs". Arthropods have legs made of jointed units.

European pill millipede
Glomeris marginata

Millipedes have between 36 and 450 legs, two pairs growing from each body segment. Pill millipedes are short, squat species with only 11–13 body segments. Like all pill millipedes, it rolls itself into a tight ball if attacked by a predator, such as a snail or a bird. It can look like a woodlouse, although its size and number of legs are a giveaway.

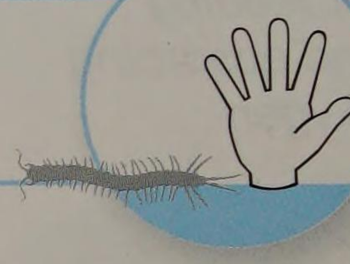
SIZE 0.6–2 cm (0.2–0.8 in) long

DIET Decaying leaves

HABITAT Soil and leaf litter in broadleaved forests

DISTRIBUTION Europe, parts of Asia, and Northern Africa

Tiger giant centipede
Scolopendra hardwickei



Centipede means "100 legs", but surprisingly, no species has exactly 100. The average centipede has 50 legs, but the most legs ever recorded for a centipede is 382. Most are active during the night. They use their venomous claws to kill prey. Many giant species, such as the tiger giant centipede, have vibrant warning colours.

SIZE 20–25 cm (8–10 in) long

DIET Invertebrates and small vertebrates

HABITAT Under rotting wood, loose bark, and leaf in litter in rainforests

DISTRIBUTION Southeast Asia

One pair of jointed legs per body segment

▲ Centipedes are arthropods with at least 16 body segments, each carrying one pair of legs.

▲ Spiders have four pairs of legs and two pairs of feeding appendages, but lack antennae.

▲ Crabs, lobsters, and shrimps have 10 legs. The first pair forms pincers.

▲ Insects, such as this beetle, have six legs, all attached to the middle body section, or thorax.

Horseshoe crab

Limulus polyphemus

Despite their name, these animals are not crabs. They are most closely related to arachnids (spiders and scorpions). They get their name from the horseshoe-shaped shell, or carapace, which covers their entire body, except the tail.

SIZE 40–60 cm (16–23 in) long

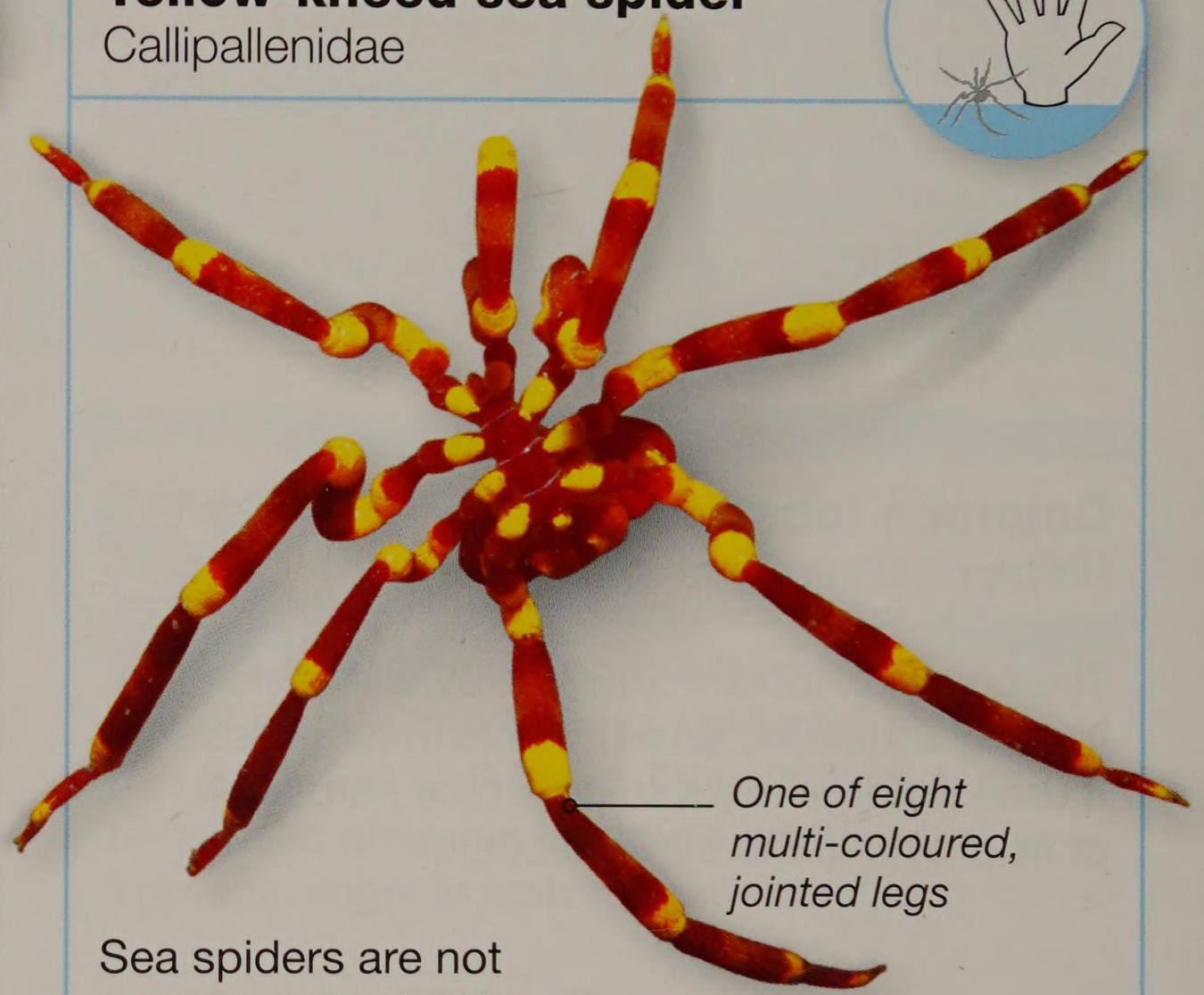
DIET Molluscs, worms, other marine animals

HABITAT Shallow seas

DISTRIBUTION Eastern coast of North America, particularly the Gulf of Mexico

Yellow-kneed sea spider

Callipallenidae



Sea spiders are not related to arachnids (spiders and scorpions). They have no breathing organs but can absorb oxygen through their skin.

SIZE 5–10 cm (2–4 in) across

DIET Soft-bodied marine animals, such as sponges, anemones, lace corals, and hydroids

HABITAT Coral reefs

DISTRIBUTION Coral reefs around Australia

Vernal pool tadpole shrimp
Lepidurus packardi

ENDANGERED

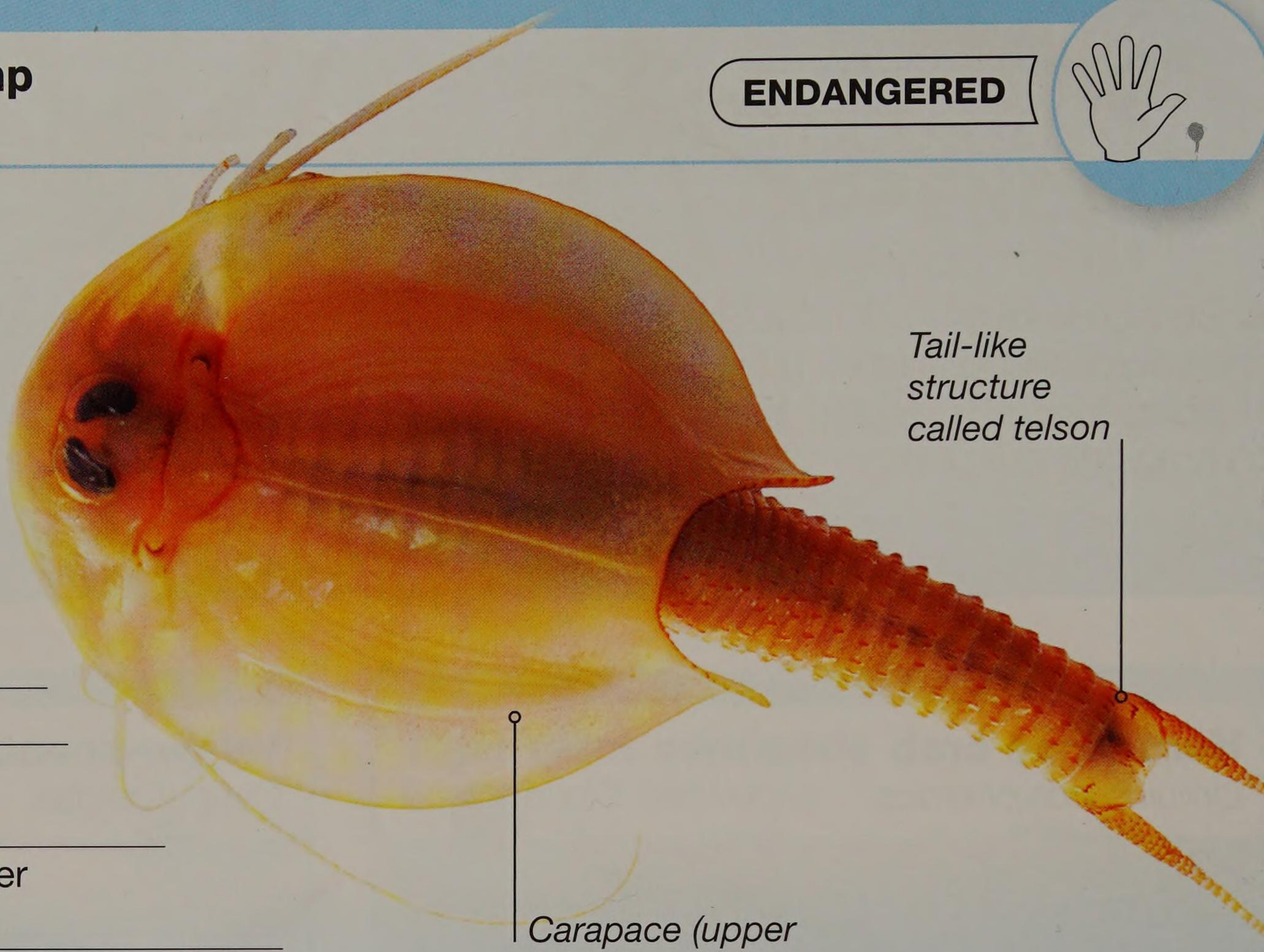
This shrimp has changed little in millions of years. It is adapted to life in vernal pools – temporary pools filled by spring rain – as its eggs can survive drying out for up to 10 years. Once hatched, the shrimp can mature in only 25 days.

SIZE 5 cm (2 in) long

DIET Fairy shrimps, insect larvae, and other invertebrates

HABITAT Vernal pools and other freshwater bodies

DISTRIBUTION USA, mainly California



Common lobster
Homarus gammarus

The common lobster smells prey with its long antennae, since it hunts in darkness. It uses its larger claw to crush the hard shell of its prey and the other to cut it.

SIZE Up to 50 cm (2 ft) long

DIET Molluscs and crustaceans

HABITAT Continental shelf

DISTRIBUTION Eastern Atlantic Ocean

White-spotted hermit crab
Dardanus megistos

The white-spotted hermit crab is "left-handed" – it has an enlarged left claw. Hermit crabs have softer bodies than other crabs, so they live in abandoned sea snail shells to protect themselves. These crabs are quite large and scavenge for food.

SIZE 13–20 cm (5–8 in) long

DIET Algae, tubeworms, and fish

HABITAT Sandy, rocky shores

DISTRIBUTION Coasts of the eastern Atlantic Ocean, Indian Ocean, and Pacific Ocean

Peacock mantis shrimp

Odontodactylus scyllarus

This vibrant shrimp is a strong hunter with forelimbs that punch with ferocious force. It has very complex eyes that provide 3-D vision and detect colour over a broad spectrum, including ultraviolet.

Clublike forelimbs can smash the shell of its prey

Carapace

SIZE 3–18 cm (1.25–7 in) long

DIET Crabs, snails, and bivalves

HABITAT Sandy or gravelly sea bed close to reefs

DISTRIBUTION Indian Ocean and Pacific Ocean

Panamic arrow crab

Stenorhynchus debilis

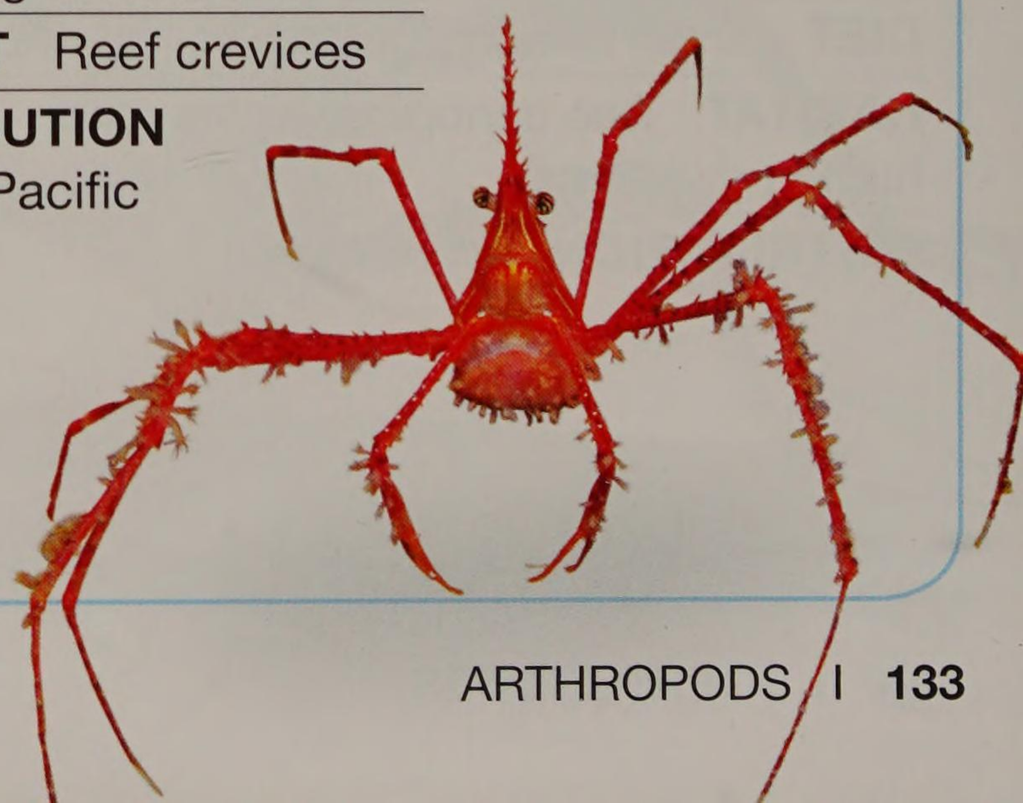
The Panamic arrow crab is a type of spider crab. It has 10 long, spiderlike legs. It is small and stalk-eyed. The elongated front of its head gives it a triangular appearance. This scavenger is active mostly at night.

SIZE 1–3 cm (0.5–1.25 in) long

DIET Algae and snails

HABITAT Reef crevices

DISTRIBUTION Eastern Pacific Ocean



Mayfly
Ephemera danica

Mayflies live most of their lives in water as nymphs. The nymphs emerge from the water and after a short time moult into adults, which are short lived. Some, but not all, mayflies emerge in May.

SIZE 1.7–2.5 cm (0.5–1 in) long

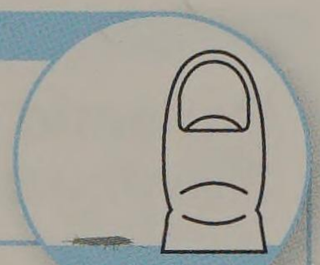
DIET Adults do not feed

HABITAT Rivers and lakes with silty bottoms

DISTRIBUTION Europe

Three long tails

Silverfish
Lepisma saccharina



The silverfish is a common species in houses. It does not like sunlight and can be found in dark, musty places. This wingless insect is active at night and may live for several years. Females lay their eggs in small crevices.

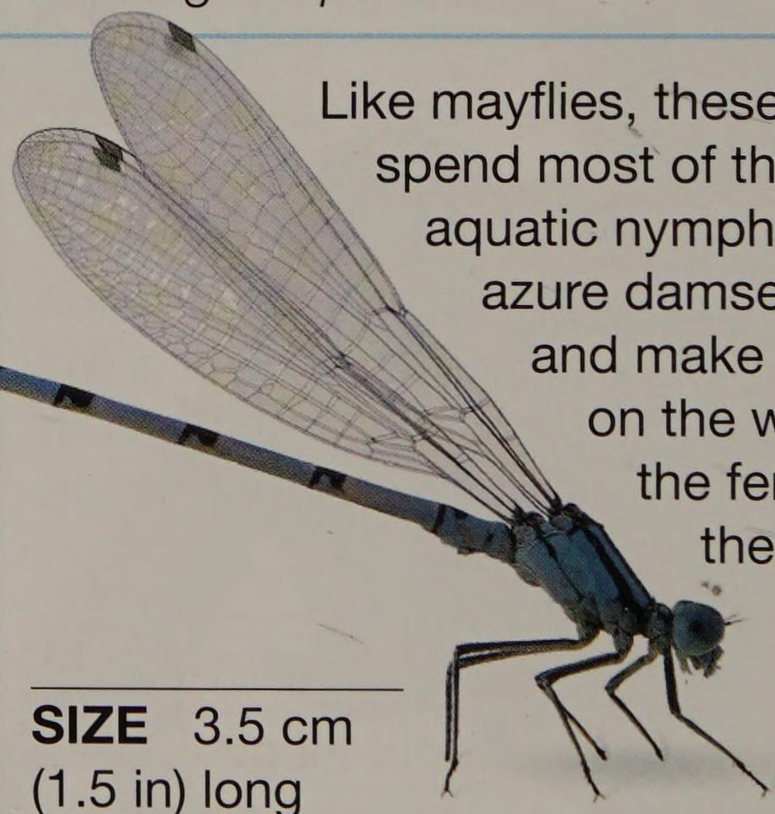
SIZE 1.2 cm (0.5 in) long

DIET Small insects, damp textiles, and paper

HABITAT Tree canopies, caves, and human dwellings

DISTRIBUTION Worldwide

Azure damselfly
Coenagrion puella



Like mayflies, these insects spend most of their lives as aquatic nymphs. The male azure damselflies may hover, and make several landings on the water, to convince the females to lay their eggs there.

SIZE 3.5 cm (1.5 in) long

DIET Water crustaceans (as nymphs); insects (as adults)

HABITAT Small ponds and streams

DISTRIBUTION Central and southern Europe to central Asia

Foaming grasshopper
Dictyophorus spumans

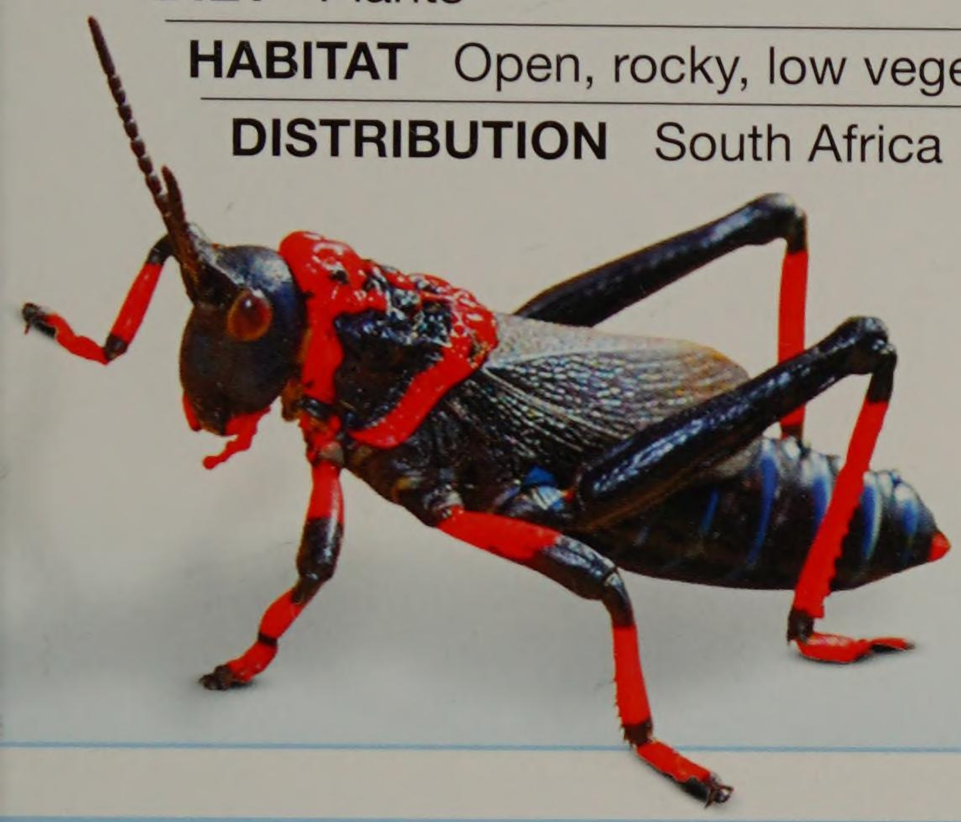
This grasshopper's vivid colours warn predators to stay away. If threatened, it produces a toxic chemical from glands in its thorax.

SIZE 6–8 cm (2.5–3.25 in) long

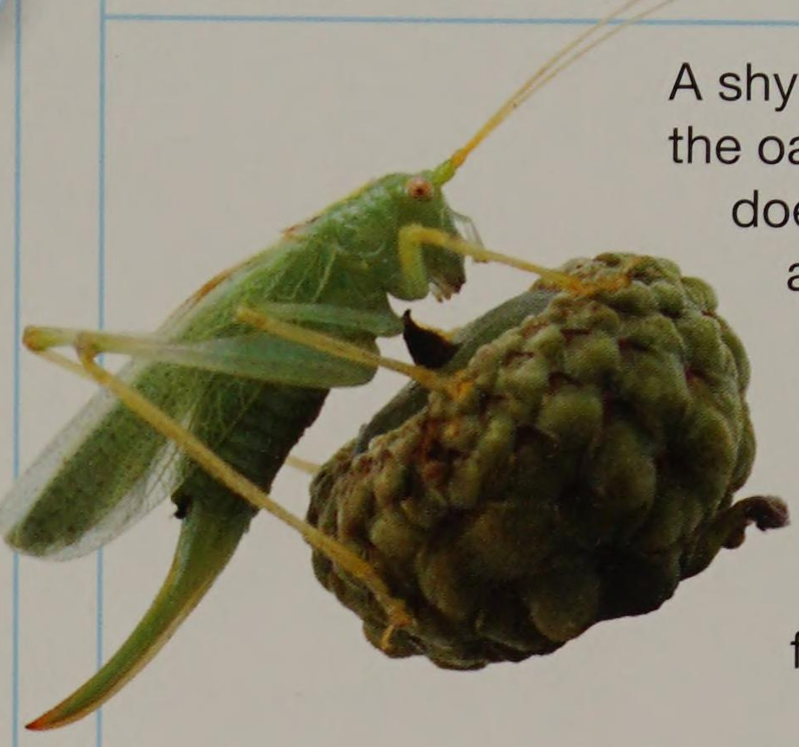
DIET Plants

HABITAT Open, rocky, low vegetation

DISTRIBUTION South Africa



Oak bush cricket
Meconema thalassinum



A shy creature, the oak bush cricket does not really have a song like most crickets. Instead, it drums on leaves with its hind legs. This small insect comes out to feed after dark.

SIZE 1.8–2 cm (0.75 in) long

DIET Small insects

HABITAT Broadleaved forests

DISTRIBUTION Europe; introduced to USA

Jungle nymph stick insect
Heteropteryx dilatata

Jungle nymph stick insects hiss and splay their hind legs if attacked. Males can fly a short distance, but females do not fly because they have only stubby wings, like an immature nymph. This inspired the name of this species.

Small, non-overlapping wing pads show that this female is still a nymph, although adults' wings are not much bigger

SIZE Up to 15.5 cm (6.25 in) long

DIET Foliage of various plants

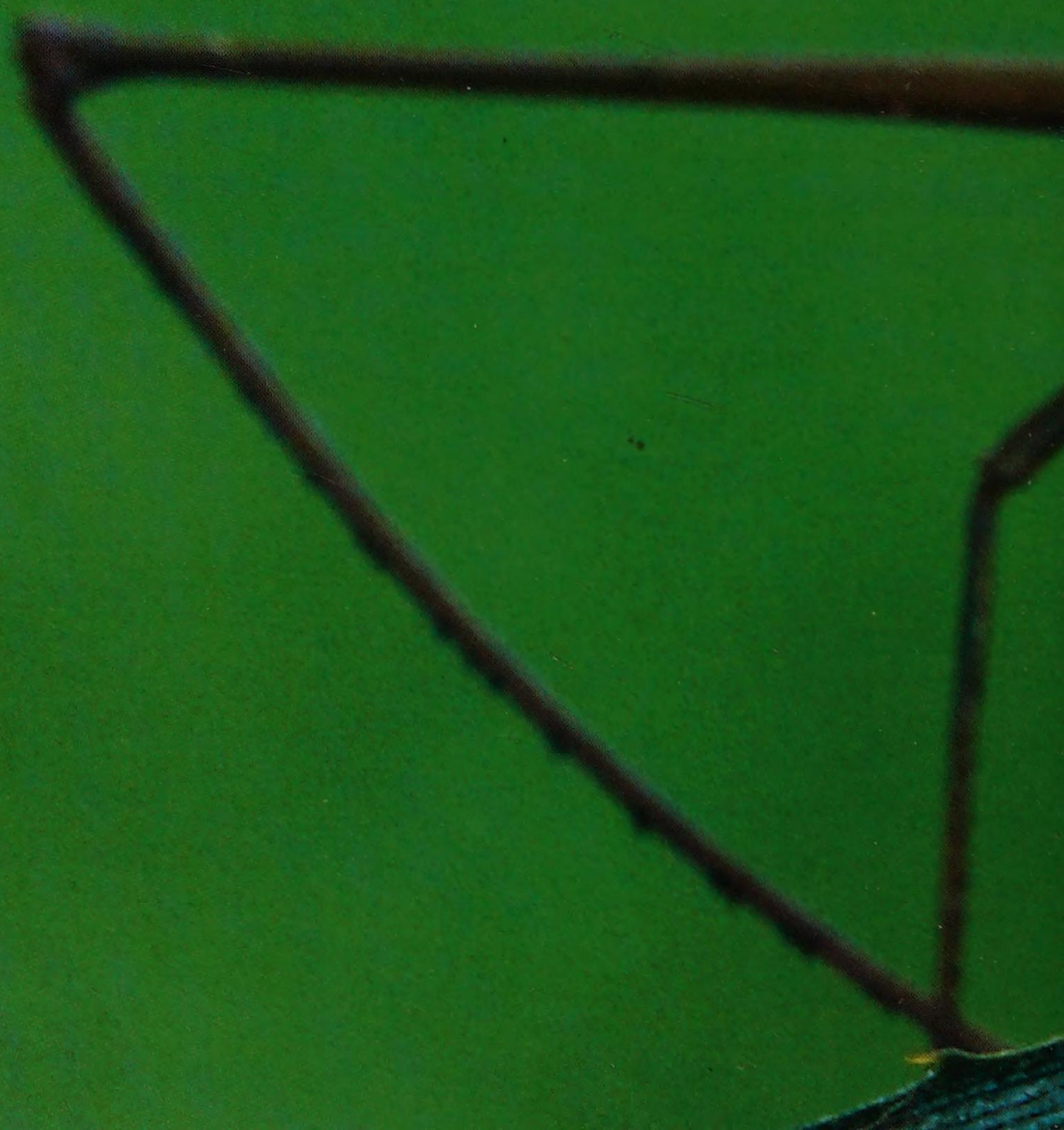
HABITAT Tropical forests

DISTRIBUTION Malaysia

The horse-head grasshopper
is also called the

jumping stick

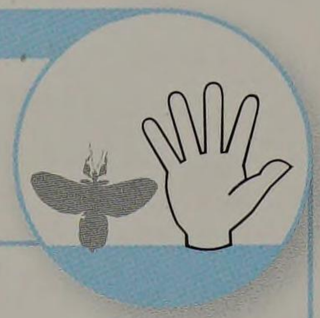
as it looks like a stick insect
but can leap like a grasshopper



HORSE-HEAD GRASSHOPPER

This grasshopper lives in the tropical rainforests of Peru. It has evolved the same kind of camouflage as the stick insect that enables it to avoid being detected by predators. If disturbed, it freezes.

Javanese leaf insect
Phyllium bioculatum



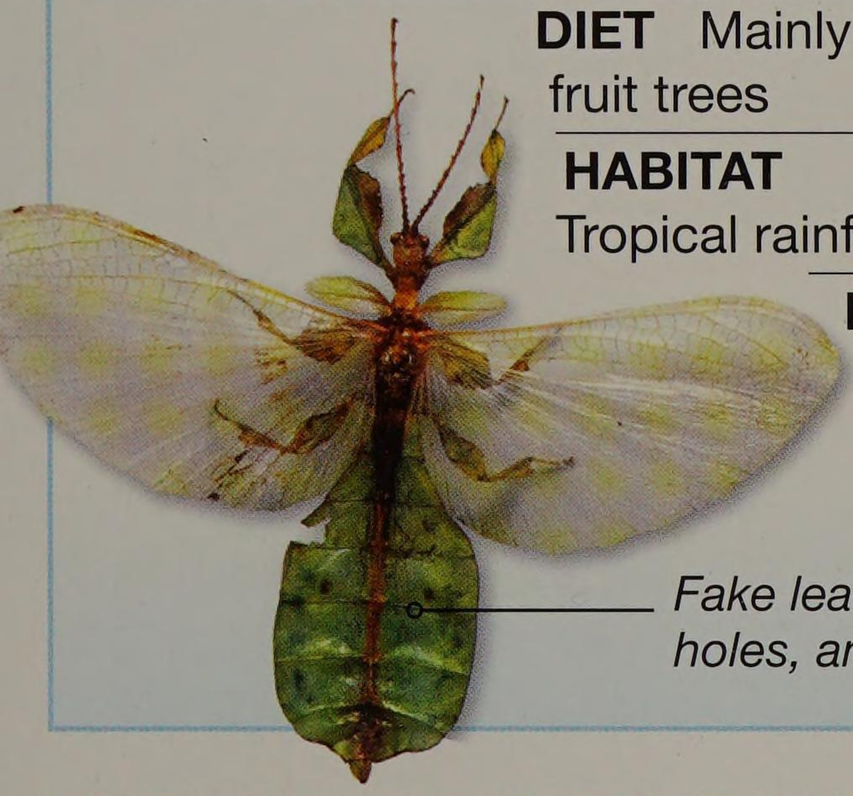
Leaf insects' ability to mimic leaves means they are overlooked by predators. This species pretends to be a dead wrinkled leaf and completes the pretence by swaying in the breeze.

SIZE 7–9.4 cm (2.75–3.75 in) long

DIET Mainly leaves of fruit trees

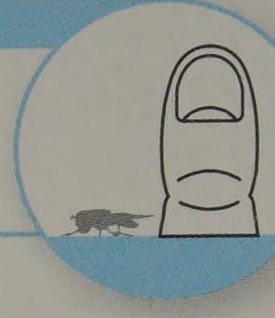
HABITAT
Tropical rainforests

DISTRIBUTION
Southeast Asia



Fake leaf veins, holes, and blotches

Hover fly
Syrphus ribesii



This insect may look like a wasp, but it is a fly. Predators keep a distance, fearing a sting. Hover flies are among the most skilled fliers. They often hover over flowers or dart after others of their kind in a high-speed chase.

SIZE 1.2 cm (0.5 in) long

DIET Nectar and pollen (as adults)

HABITAT Flower-rich meadows

DISTRIBUTION Europe

Orchid mantis
Hymenopus coronatus

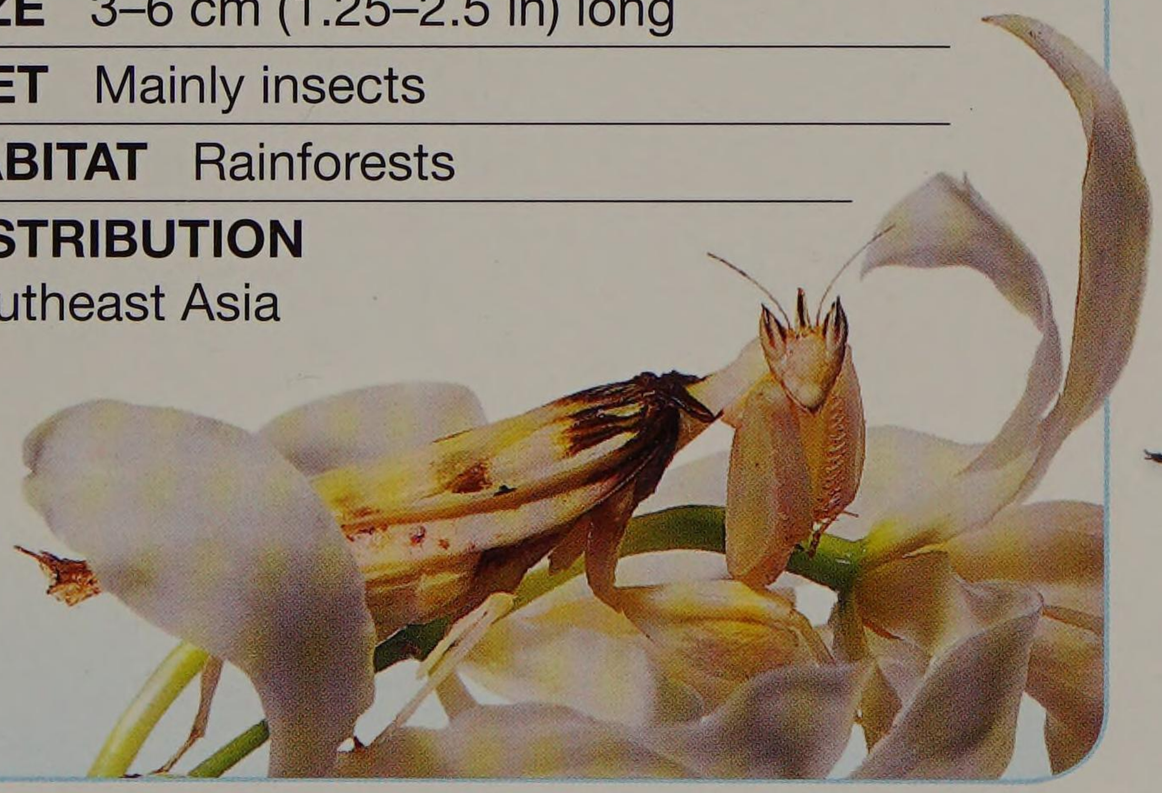
The orchid mantis lurks among white orchids, waiting quietly for its prey to come within range. It quickly grabs its victim with long, spiked forelegs.

SIZE 3–6 cm (1.25–2.5 in) long

DIET Mainly insects

HABITAT Rainforests

DISTRIBUTION
Southeast Asia



Jewelled frog beetle
Sagra buqueti

Collectors prize the attractive jewelled frog beetle. It has strong froglike hind legs that it uses in defence or in male-to-male combat. Like all beetles, it has hard forewings called elytra, which form a protective case over the hind wings.

SIZE 3–3.5 cm (1.25–1.5 in) long

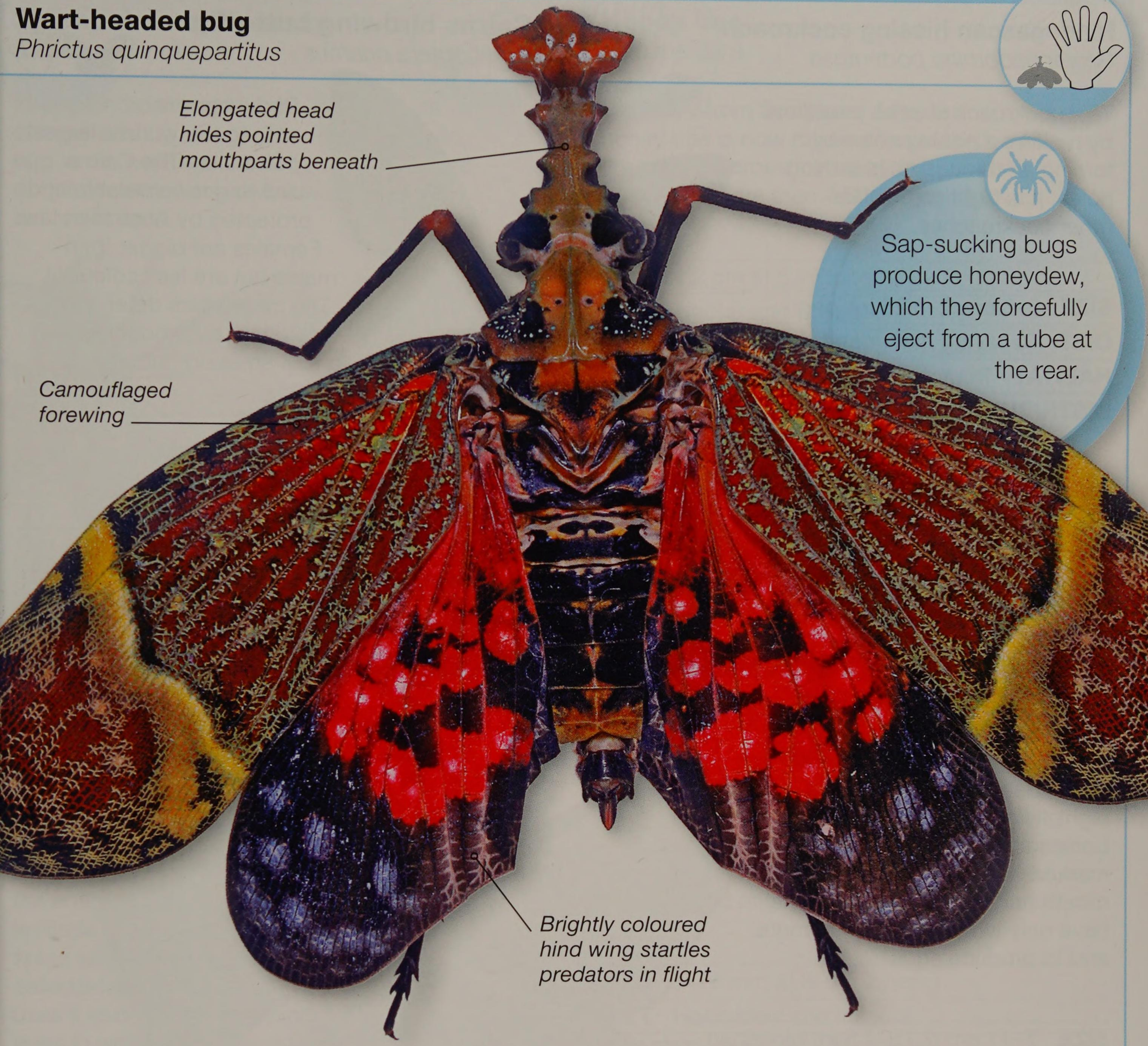
DIET Leaves and pollen

HABITAT
Most plants

DISTRIBUTION
Southeast Asia, mainly Thailand

Wart-headed bug

Phrictus quinquepartitus



Sap-sucking bugs produce honeydew, which they forcefully eject from a tube at the rear.

Also known as the "dragon-headed bug", this species has a bizarrely shaped head. It belongs to a group of insects called the bugs, none of which can bite or eat solid food. Instead, it uses its pointed beak to stab plants and suck up sap.

SIZE 5.5 cm (2.25 in) long

DIET Sap of plants and trees

HABITAT Forests

DISTRIBUTION Costa Rica, Panama, Colombia, and parts of Brazil

Madagascan hissing cockroach

Gromphadorhina portentosa

This cockroach startles predators by making a hissing noise by forcing air through its breathing holes. It is flightless, unlike other cockroaches.

SIZE 5–8 cm (2–3.25 in) long

DIET Decaying matter and dung

HABITAT Tropical forests and caves

DISTRIBUTION Madagascar

Cairns birdwing butterfly

Ornithoptera priamus

Birdwings are among the world's largest butterflies. The Cairns birdwing is vulnerable and protected by Australian law. Females are bigger than males but are less colourful. The caterpillars deter predators by producing a foul-smelling odour.

SIZE 16–18 cm (6.5–7 in) wingspan

DIET Nectar (as adults)

HABITAT Flower-rich tropical forests

DISTRIBUTION From Papua New Guinea and Solomon Islands to tropical North Australia

American Moon moth

Actias luna

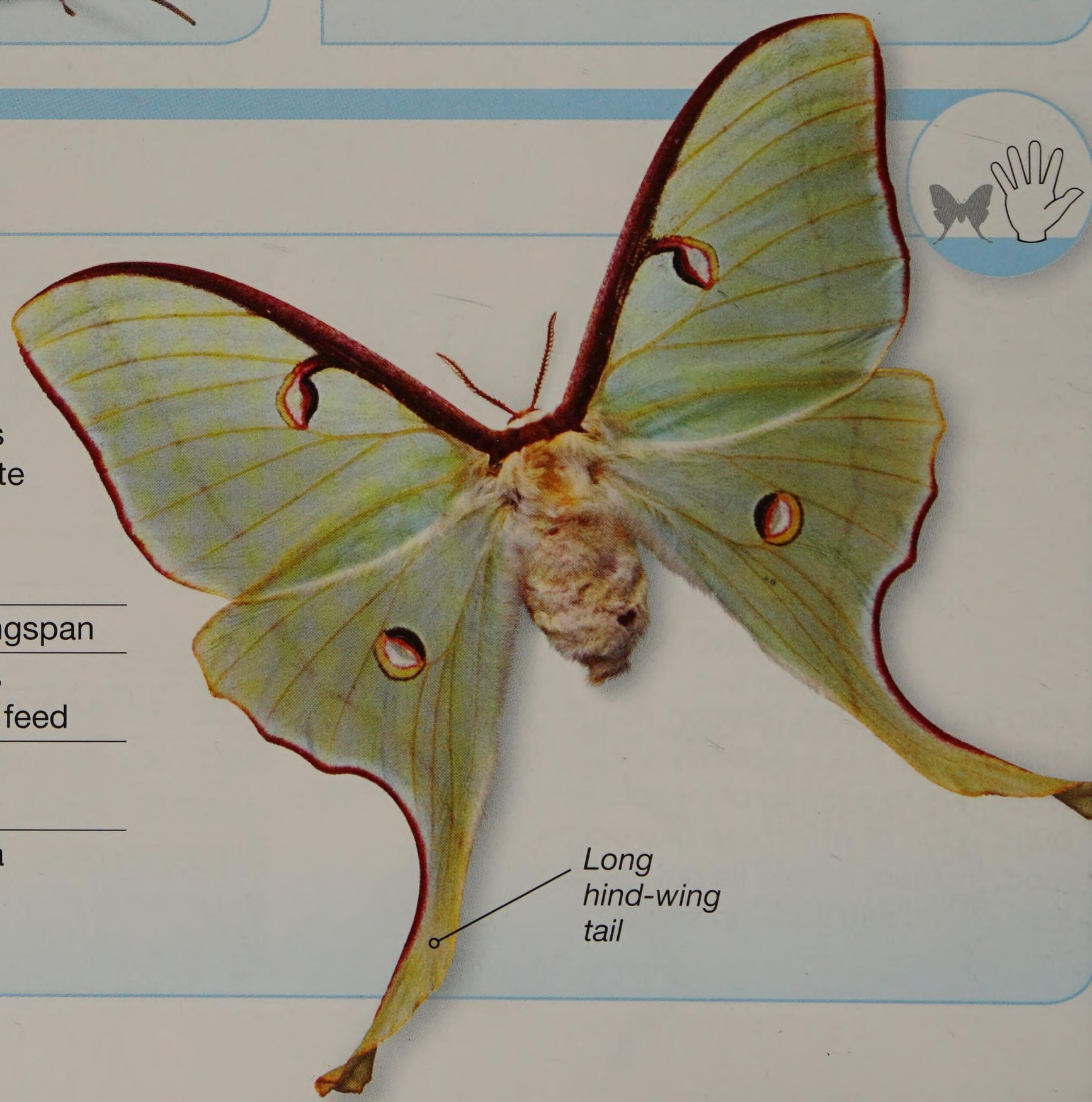
These delicately coloured night-flying moths have heavy bodies and broad, beautifully marked wings. In adults, the mouth parts do not work. Adults have only two functions – to mate and to produce eggs.

SIZE 7–11 cm (2.75–4.5 in) wingspan

DIET Young feed on the leaves of deciduous trees; adults don't feed

HABITAT Tropical and subtropical forests

DISTRIBUTION North America



Splendid emerald wasp
Stilbum splendidum

The splendid emerald wasp is a parasite of mud-nesting wasps. The female lays an egg in the nest and when her larva hatches out, it uses the larva of the wasp as a fresh source of food.

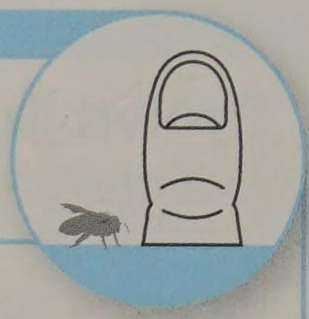
SIZE 1.8–2 cm (0.75 in) long

DIET Pollen

HABITAT Wasp nests

DISTRIBUTION
Northern Australia

Honey bee
Apis mellifera



Originally from Southeast Asia, the honey bee is now raised all over the world. It was first domesticated by the ancient Egyptians more than 4,500 years ago.

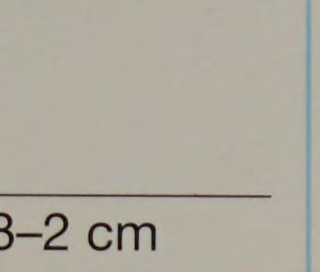
SIZE 1.2 cm (0.5 in) long

DIET Nectar and pollen

HABITAT Forests, mountains, grasslands, and urban areas

DISTRIBUTION
Worldwide

Horntail
Urocerus gigas



Very deceptive in appearance, the horntail does not sting. The "horn" at the end of its abdomen is made up of a harmless spine and an egg-laying tube called an ovipositor. The female uses it to drill holes into pine trees in which to lay her eggs.

SIZE 3.5–4 cm (1.5 in) long

DIET Fungus and wood

HABITAT Deciduous and coniferous trees

DISTRIBUTION Europe, Asia, northern Africa, and North America

Wood ant
Formica rufa

Wood ants capture aphids and farm them in their nests, milking them by stroking each individual until it releases a drop of sweet honeydew for the ants to feed on. Wood ants spray formic acid if disturbed.

SIZE 8–10 mm (0.3–0.5 in) long

DIET Honeydew and insects

HABITAT Temperate forests

DISTRIBUTION Europe and Asia

Brown jumping spider

Evarcha arcuata

Jumping spiders have excellent eyesight. Their eight eyes allow them to sense movement from any direction to avoid predators. Their large, forward-facing eyes allow them to judge distance accurately to pounce on prey. Before leaping, a jumping spider produces a safety line of silk just in case it misses its target.

SIZE 5–7 mm (0.2–0.25 in) long

DIET Arthropods

HABITAT Grasslands

DISTRIBUTION Europe and Asia

Mexican red-kneed tarantula

Brachypelma smithi

Also known as bird-eating spiders, these spiders are large enough to kill small mammals and reptiles with a venomous bite. They use their irritating body hairs in defence.

Legs are covered in hairs that are sensitive to touch and air movements, helping the spider to sense prey

SIZE 5–7.5 cm (2–3 in) long

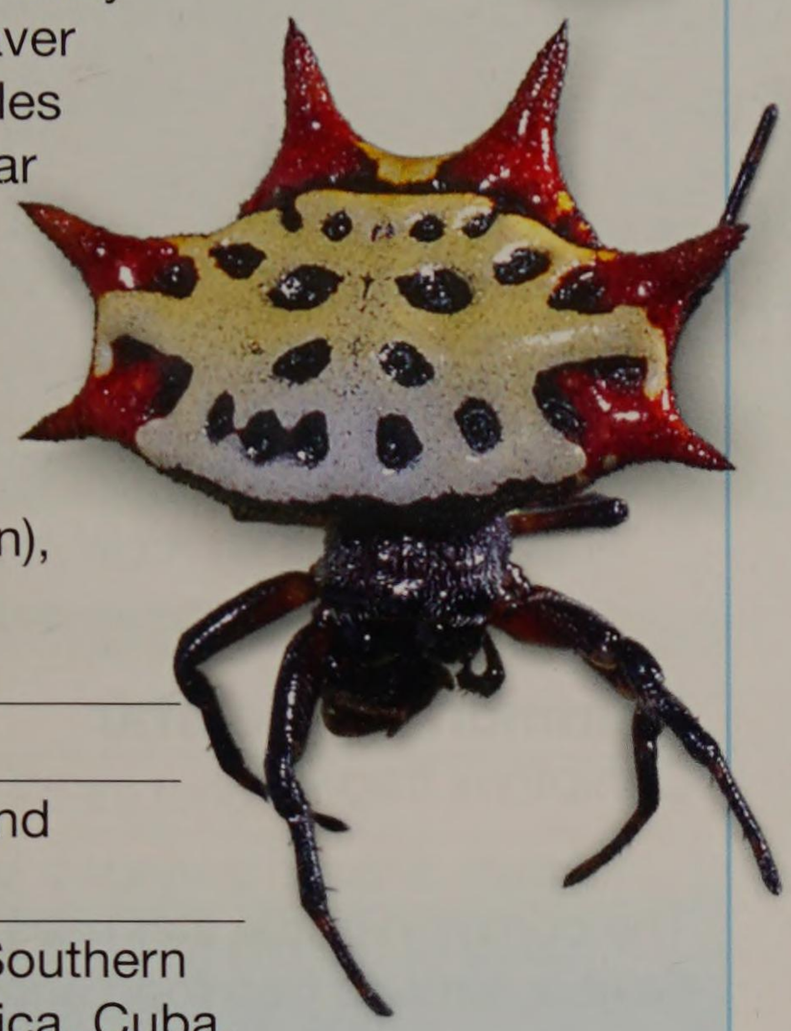
DIET Mainly large insects

HABITAT Tropical deciduous forests

DISTRIBUTION Mexico

Spiny orb-weaver
Gasteracantha cancriformis

Its bright and spiny body makes this orb weaver easy to spot. Females spin typically circular webs. Males are much smaller.



SIZE Female 5–9 mm (0.2–0.35 in), male 2–3 mm (0.08–0.12 in) long

DIET Insects

HABITAT Woodland edges and shrubs

DISTRIBUTION Southern USA, Central America, Cuba, and Jamaica

Common velvet mite
Trombidium holosericeum

After a heavy downpour, velvet mites come crawling out of the soil to mate and lay eggs. When young, they live parasitically on other arthropods, such as insects and spiders, but turn predatory as adults. They get their name from the dense, red fur on their bodies.

SIZE 3–5 mm (0.12–0.2 in) long

DIET Insect eggs (as adults)

HABITAT Tropical forests

DISTRIBUTION Europe and Asia

Imperial scorpion
Pandinus imperator

One of the largest scorpions, the imperial scorpion usually stalks its spider prey before grabbing it and crushing it with its claws. The venomous sting at the end of its tail is mainly used for defence.

SIZE 15–25 cm (6–10 in) long

DIET Spiders, lizards, and small mammals

HABITAT Among leaf litter in tropical forests

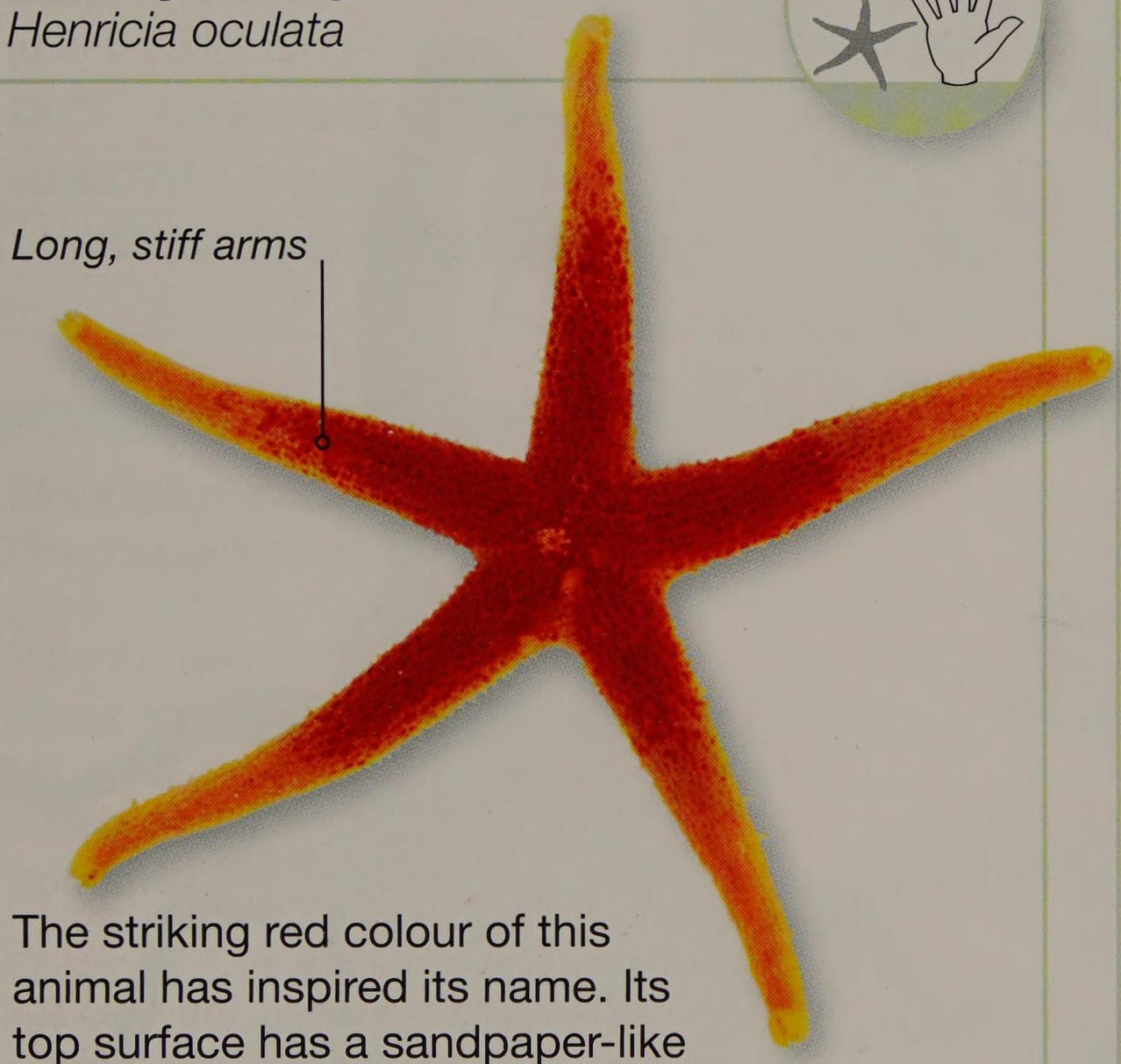
DISTRIBUTION Central and western Africa

Echinoderms

This astonishing array of colourful sea creatures is found only in ocean habitats. Echinoderms' bodies are usually formed from five equal parts arranged in a circle. They have an internal system of water-filled tubes that ends in tube feet, which lets them use water to move and take in oxygen and food.

Bloody Henry starfish

Henricia oculata



The striking red colour of this animal has inspired its name. Its top surface has a sandpaper-like texture. Food particles stick to mucus coating the starfish's underside. Its hundreds of tube feet guide the food to its central mouth.

SIZE 10–12 cm (4–4.75 in) across

DIET Invertebrates, such as sponges

HABITAT Tidal pools and kelp forests

DISTRIBUTION Northeastern Atlantic

Common brittle star

Ophiothrix fragilis

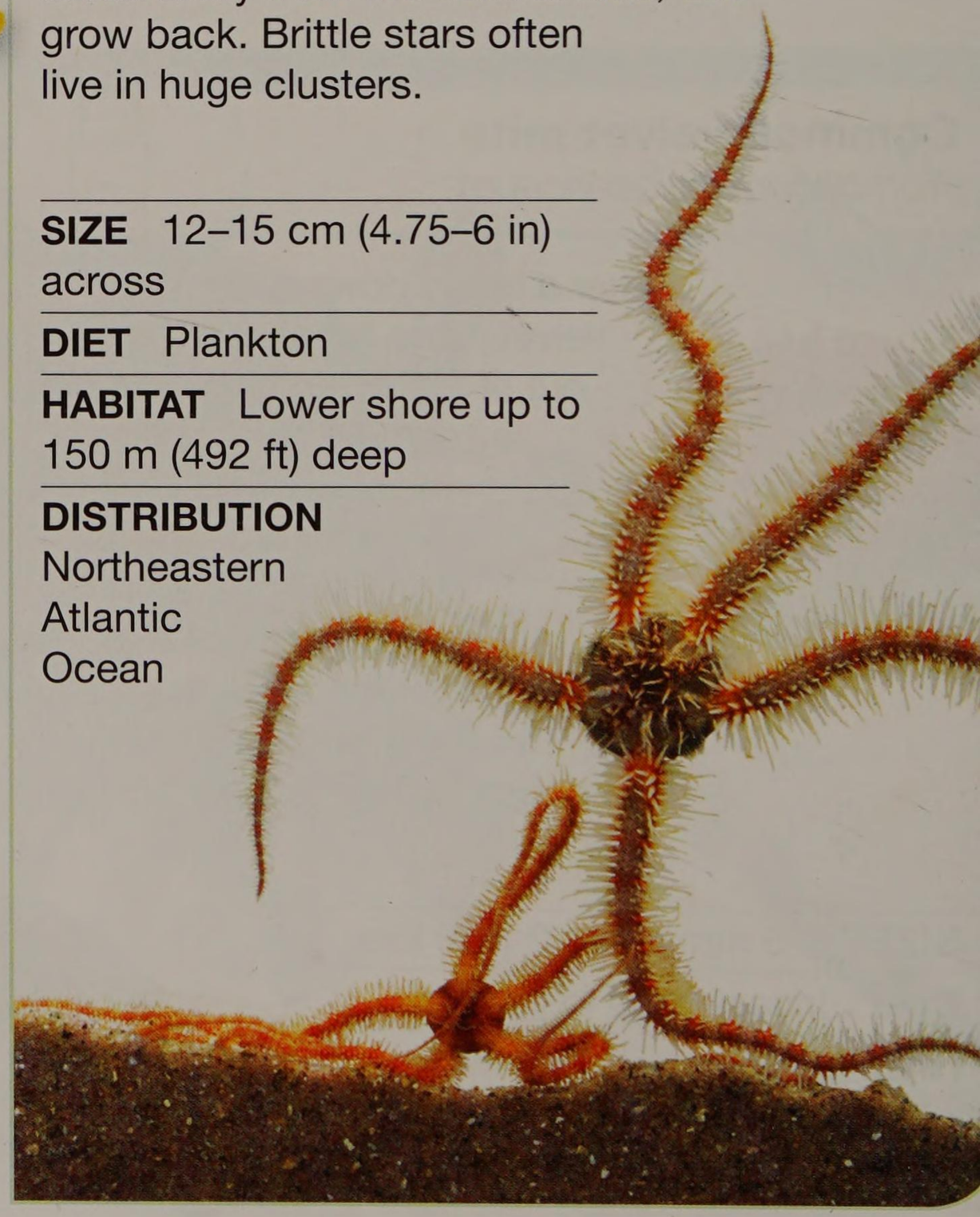
The common brittle star uses its long, flexible arms to trap food and also to walk away from danger. The snakelike arms often break away from the central disc, but grow back. Brittle stars often live in huge clusters.

SIZE 12–15 cm (4.75–6 in) across

DIET Plankton

HABITAT Lower shore up to 150 m (492 ft) deep

DISTRIBUTION
Northeastern Atlantic Ocean



Yellow sea cucumber
Colochirus robustus

Sea cucumbers are soft, tubular animals with a mouth surrounded by food-collecting tentacles. Many sea cucumbers, such as this one, are covered in knobby projections.

SIZE 5–8 cm (2–3.25 in) long

DIET Plankton and decaying organic matter

HABITAT Sea bed, 8–25 m (26–82 ft) deep

DISTRIBUTION Indian Ocean and Pacific Ocean

Red urchin
Astropyga radiata

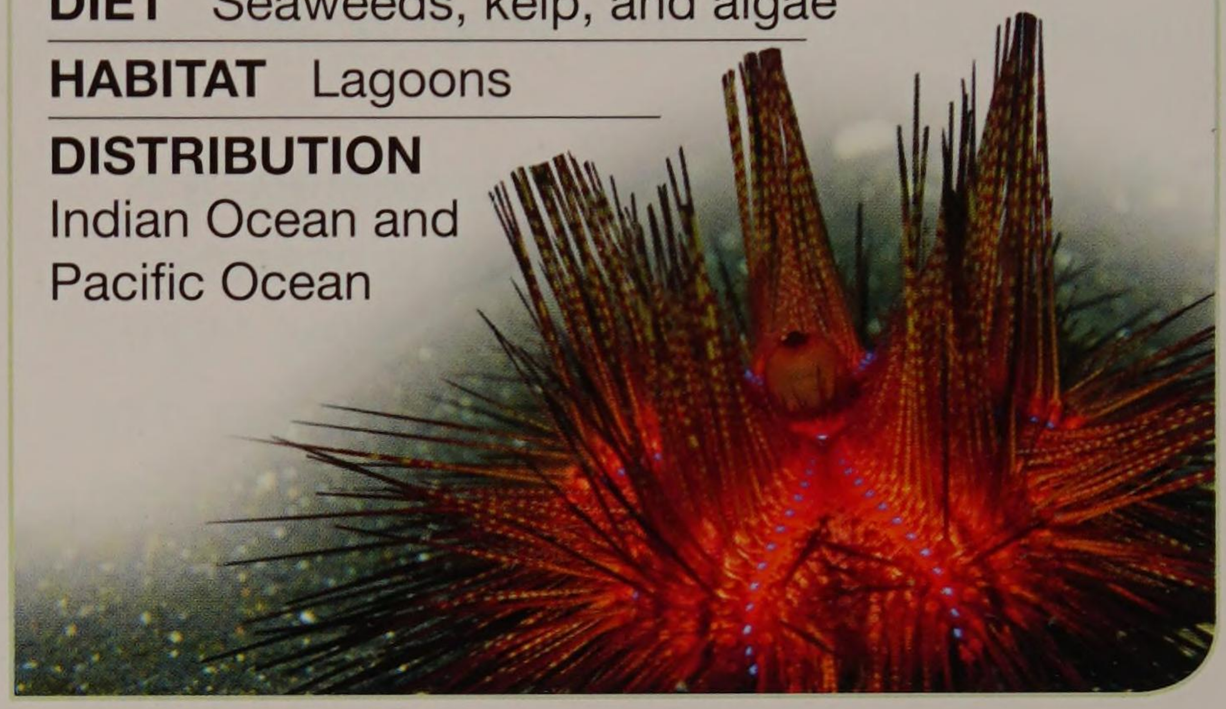
The hard body covering of the red urchin has long, hollow spines and in between are rows of tube feet, which it uses to walk across the sea bed. It is often carried by an urchin crab.

SIZE 20 cm (8 in) across

DIET Seaweeds, kelp, and algae

HABITAT Lagoons

DISTRIBUTION Indian Ocean and Pacific Ocean



Red feather star
Himerometra robustipinna

Feather stars are similar to starfish, except their mouth faces upwards. They feed on plankton caught by their featherlike arms. Red feather stars are often seen clinging to sponges and corals.

Feathery arm

SIZE 10–15 cm (4–6 in) across

DIET Plankton

HABITAT Tropical coastal waters

DISTRIBUTION Indian Ocean and Pacific Ocean

Record breakers

FASTEST ANIMALS

★ **Fastest animal on land**
A cheetah can run at speeds of up to 112 kph (70 mph) in short bursts, making it the fastest animal on land.

★ **Fastest speed achieved by a land animal over a long distance**
The antelopelike pronghorn of the North American prairies can sustain a speed of 56 kph (35 mph) over a distance of 6 km (4 miles) and 67 kph (42 mph) over a distance of 1.6 km (1 mile).

★ **Fastest bird in flight**
A peregrine falcon can reach speeds of 325 kph (200 mph) when diving – usually to catch prey such as pigeons and doves.

★ **Fastest bird on land**
The ostrich is the fastest bird on land and can run at a speed of 73 kph (45 mph). It is also the biggest bird on land, weighing up to 156 kg (345 lb).

★ **Fastest fish**
The sailfish can swim at speeds of up to 110 kph (68 mph) in short bursts. It often hunts in groups by shoaling fish.

★ **Fastest mammal in water**
The Dall's porpoise can surge through water at a speed of 56 kph (35 mph).

★ **Fastest shark**
The world's fastest shark is the mako shark. Estimates of its maximum speed range from 50 kph (31 mph) to 95 kph (59 mph).

SLOWEST ANIMALS

• **Slugs** are the slowest animals in the world with a maximum speed of 0.05 kph (0.03 mph).

• **Giant tortoises** are the slowest reptiles on land. Their maximum speed range has been recorded at 0.2–0.5 kph (0.12–0.3 mph). They can live longer than most other animals.

• **Seahorses** move by fluttering their dorsal fins. They are the slowest fish with a recorded speed of 0.001 kph (0.0006 mph).

• **Three-toed sloths** travel at a top speed of 0.24 kph (0.15 mph), making them the slowest land mammals.

• **American woodcocks** are the slowest flying birds, reaching a top speed of just 8 kph (5 mph).

LARGEST OF ALL

♦ Largest animal
The world's largest animal is the blue whale. Females can grow to a length of 27 m (89 ft) and weigh more than 100 tonnes.

♦ Largest animal on land
African savanna elephants are the largest animals on land. The largest elephant known measured 4 m (13 ft) tall at the shoulder and was estimated to weigh more than 10,000 kg (22,000 lb).

♦ Largest fish
Whale sharks are longer than many whales. They grow to around 12 m (39 ft) in length.

♦ Largest reptile
The saltwater crocodile is 6 m (20 ft) long, making it the largest reptile on Earth.

♦ Largest invertebrate
Colossal squids can reach a length of 13 m (43 ft) and at 495 kg (1,090 lb), they are the largest invertebrates.

♦ Largest invertebrate on land
The coconut crab, or robber crab, has a legspan of 76 cm (30 in). This crustacean climbs palm trees to eat fruit.

♦ Largest amphibian
The Chinese giant salamander is the largest amphibian. It can be as long as 1.8 m (6 ft) and can weigh 50 kg (110 lb).

♦ Largest wingspan
The wandering albatross has a gigantic wingspan of 3.5 m (11.5 ft).

♦ Largest animal colony
An 80-year-old colony of Argentinian ants is spread over 6,000 km (3,728 miles) between Portugal and Italy.

The giant mouth of the world's largest animal, the blue whale, can expand to hold up to 90 tonnes of food and water.

♦ Largest structure built by living creatures
Australia's Great Barrier Reef is 2,300 km (1,430 miles) long, covering an area of 344,000 sq km (133,000 sq miles). It is made up of solid remains of countless generations of coral polyps.

♦ Largest insect swarm
The largest swarm (group of flying insects) record was of desert locusts in Kenya in 1954. The swarm covered an area of 200 sq km (77 sq miles) with a density of 50 million individuals per sq km (0.39 sq mile), making 10 billion locusts in the swarm.

LONGEST OF ALL

▶ Longest animal
Measuring more than 30 m (98.5 ft) in length, the world's longest animals are not blue whales, but a species of ribbon worm.

▶ Longest snake
The Asian reticulated python is the longest snake in the world and the longest one on record measured 10 m (33 ft).

▶ Longest insect
A newly discovered species of stick insect found in 2008 is the longest insect in the world. Chan's megastick measures 56.7 cm (22.3 in) in length. Its body (excluding the legs) is 35.7 cm (14 in) long.

▶ Longest horns
A subspecies of wild water buffalo that lives in India and Burma (Myanmar) has the longest horns. The record pair measures 1.1 m (3.5 ft) from tip to tip.

▶ Longest nose
An elephant's trunk can be as long as 2.5 m (8.25 ft). It uses its trunk to smell, to put food in its mouth, and to signal to other elephants.

A giraffe can grow up to 5.8 m (19 ft) tall, making it the world's tallest animal.

▶ Longest jump by an insect
The froghopper, or spittle bug, is 6 mm (0.25 in) long and can hurl itself up to 61 cm (24 in) into the air.

▶ Longest arms of any primate
Compared to its body size, a gibbon's arms are the longest among primates. Its arms are around 1.5 times as long as its legs. These tree-dwelling primates use their long arms to swing from one branch to another at high speeds.

▶ Longest fangs
The gaboon viper has the longest fangs of any snake. The average length of the snake is 1.5 m (5 ft) and its fangs can be as long as 5 cm (2 in). The fangs are kept folded against the roof of the snake's mouth.

▶ Longest bill
At up to 47 cm (18.5 in) long, the bill of the Australian pelican is the longest in the world.

▶ Longest tooth
The single tooth, or tusk, of a male narwhal can be as long as 3 m (10 ft). It uses its tusk to defend itself against predators as well as against other males during the mating season.

LONGEST MIGRATIONS

Many animals undertake long journeys, called migrations, in search of food, or to breed.

• Longest migration of any animal
Arctic terns fly between the Arctic and the Antarctic every year, covering a round-trip distance of 70,800 km (44,000 miles). They raise chicks in nests in the Arctic tundra, then fly south to avoid the Arctic winter.

• Longest mammal migration
Grey whales have the longest known migration of any mammal. They travel 16,000–21,000 km (10,000–13,000 miles) every year.

• Longest non-stop migration
A single bar-tailed godwit (a small wading bird) was tracked during a non-stop flight between Alaska and New Zealand, covering 11,500 km (7,145 miles).

• Longest insect migration
The monarch butterfly travels around 4,500 km (2,800 miles) every year. However, no individual completes the entire trip. The insects move south from North America to Mexico every autumn. In spring they head back north. The females die after laying eggs on the way and new generations continue the journey.

HEAVIEST OF ALL

Heaviest flying bird
The great bustard can weigh up to 18 kg (40 lb).

Heaviest raptor
The average weight of a male Andean condor is 10.7 kg (23.5 lb), making it the world's heaviest raptor.

Heaviest snake
The green anaconda can weigh as much as 100 kg (220 lb), making it the heaviest snake. Its weight can increase by more than half after it has eaten a meal.

SMALLEST ANIMALS

★ The smallest insect – a type of parasitic wasp called a fairyfly – is 0.10–0.17 mm (0.004–0.007 in) long.

★ *Paedocypris progenetica*, a tiny fish of Indonesian peat swamps, is the world's smallest fish at only 7.9 mm (0.3 in) long.

★ The bee hummingbird is the smallest bird. It is 5–6 cm (2–2.5 in) in length.

★ The smallest mammal is the bumblebee bat of Thailand. It is 29–33 mm (1.1–1.3 in) long and weighs about 2 g (0.07 oz).

Glossary

Antenna Paired sensory organ on the heads of some invertebrates, such as insects, used to detect vibrations, smells, and tastes.

Antler Paired bony growth on the head of deer. Unlike horns, antlers are shed and grow back every year.

Aquatic Living or growing in or near water.

Asexual reproduction A form of reproduction in which one organism produces offspring without mixing its genes with another parent.

Baleen A brushlike fringe that hangs from the upper jaw in some whales. The baleen strains food from water.

Barbel Whiskerlike sensory structures around the mouths of some fish, such as catfish, used to find food.

Beak A set of protruding jaws made of keratin, usually without teeth. Birds, turtles, and tortoises have beaks.

Blubber The thick layer of fat that protects some animals, such as whales and seals, from the cold.

Camouflage Colours or patterns on an animal's skin or fur that allow it to blend with its surroundings.

Carnivore An animal that eats only meat. It also refers to the mammals in the order Carnivora, such as dogs.

Carrion The remains of dead animals.

Cartilage A firm, flexible tissue that is part of the skeleton of some vertebrates. In sharks, the entire skeleton is made up of cartilage.

Cell The smallest unit in the body of a living organism. It can copy itself to form the different tissues that make up the body of the organism.

Colony A group of animals belonging to one species that live together.

Coniferous Describes plants, including pine and fir trees, which lack flowers and fruit and produce cones containing their seeds.

Courtship Behaviour that helps form a bond between a male and a female before mating. It also allows the partners, particularly the female, to assess their potential match and decide whether or not to mate.

Crustacean A type of mainly aquatic arthropod with a hard shell and two pairs of antennae.

Deciduous Describes trees that shed leaves in autumn and grow new ones in spring.

Echolocation One way in which dolphins and bats find their way and locate food. It involves sending out sound signals and then listening for the echoes that bounce back off objects around them.

Ecosystem A collection of species living in the same habitat that interact with each other and their environment.

Ectotherm An animal that cannot maintain a constant body temperature. Instead, its body temperature varies with its environmental conditions. Also known as cold-blooded. For example, reptiles are cold-blooded and sunbathe to warm up.

Embryo An organism in its early stages of development.

Endangered species A species that is in danger of becoming extinct, such as the Cuban crocodile.

Endotherm An animal that can maintain a constant body temperature internally, using a lot of energy to heat its body or cool it. Also known as warm-blooded.

Extinct A species of plant or animal that has died out, such as the Chinese river dolphin.

Fertilization The process by which a sex cell from a male joins with one from a female to produce new organisms. It can be internal or external. In external fertilization, the process occurs outside the body of the female.

Filter feeder An animal that feeds by taking in large amounts of water with suspended particles of food, which are then strained out of the water.

Flipper A paddle-shaped limb of an aquatic mammal or reptile.

Habitat The environment in which an animal lives.

Herbivore An animal that feeds only on plants or plantlike plankton.

Hibernation The ability of some animals to lower their heart rate and body temperature and become inactive during colder months when food is scarce.

Horn A structure on the head of some hoofed mammals that is made of a bony core covered with a sheath of keratin.

Host An animal on which a parasite feeds.

Invertebrate Any animal without a backbone.

Keel An enlargement of the breastplate in most birds that anchors the muscles used in flight.The ratites lack this feature.

Keratin A tough protein found in hair, nails, claws, hooves, and horns.

Larva The immature, often wormlike, form that hatches from the eggs of many insects and other invertebrates.

Mantle The body wall of a mollusc. In shelled molluscs, it builds up the shell. It is made up of a fold of skin that protects the internal organs.

Marine Found in the sea.

Metamorphosis A major change in an animal's body shape during its life cycle. Caterpillars turn into butterflies or moths through metamorphosis.

Migration A journey undertaken by an animal due to seasonal changes, usually to find food or to breed.

Nymph An early stage of development of an invertebrate that generally looks and lives in the same way as the organism's adult form.

Omnivore An animal that eats both plants and animals.

Pack A group of animals that hunt together.

Parasite An animal that lives on, or inside, the body of another species, known as the host. It feeds on the host animal or on food the host has swallowed. It has a harmful effect on the host.

Pigment A substance that colours the tissues of an organism.

Placenta The organ inside the womb of many female mammals that allows exchange of nutrients and waste between the mother and developing young.

Plankton The mass of tiny aquatic microorganisms and animals that are eaten by larger animals.

Predator An animal that hunts, kills, and eats other animals.

Prey An animal that is hunted, killed, and eaten by a predator.

Protein A type of complex chemical found in all life forms.

Pupa The stage in the life cycle of certain insects in which the larva is protected by a special case as it metamorphoses into the adult form.

Rainforest Dense tropical woodland that receives heavy rainfall.

Scales Plates that protect the skin of most fish and some reptiles.

Scavenger An animal, such as a vulture, that feeds on the remains of dead animals or plants.

Spawning The process in which an animal produces or deposits eggs. Spawning is common in water-living animals.

School A large group of fish moving as one.

Species A group of organisms that breed only with each other.

Talons The sharp claws of a bird of prey.

Thorax The middle section of an insect's body. It bears the legs and wings.

Temperate Relating to the region of the world between the tropical and polar regions that is neither extremely hot nor very cold.

Territory An area occupied by an animal or group of animals from which other members of the same species are excluded. Territories are usually defended from other members but sometimes only during the breeding season.

Troop A gathering of one kind of primate, such as monkeys.

Tropical Relating to the hot region of the world spanning the Equator, between the tropics of Cancer and Capricorn.

Vertebrate Any animal with a backbone.

Wingspan The measurement from the tip of one wing of a bird or insect to that of the other when the wings are outstretched.

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